FOR YOUR SAFETY
If you smell gas:

1. **Open windows.**
2. **DO NOT try to light any appliance.**
3. **DO NOT use electrical switches.**
4. **DO NOT use any telephone in your building.**
5. **Extinguish any open flame.**
6. **Leave the building.**
7. **Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.**
8. **If you cannot reach your gas supplier, call the Fire Department.**

⚠ WARNING

Fire Hazard

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.

ROBERTS GORDON

Blackheat® HE

Vacuum Assisted Linear, Double Linear, U-Tube, and Multi-Burner Gas Fired Heating Systems

Installation, Operation & Service Manual

HE15UT	**HE15ST**	**HE30DL**
HE20UT	**HE20ST**	**HE40DL**
HE25UT	**HE25ST**	**HE50DL**
HE30UT	**HE30ST**	**HE60DL**
HE35UT	**HE35ST**	**HE70DL**
HE40UT	**HE40ST**	
HE45UT	**HE45ST**	
HE50UT	**HE50ST**	

IP55 Protected Burner Box

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can result in death, injury or property damage. Read the installation, operation and service manual thoroughly before installing or servicing this equipment.

Installation must be done by a registered installer/ contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.

Installer

Please take the time to read and understand these instructions prior to any installation.
Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place in order to provide your service technician with necessary information.

CE

Roberts-Gordon Europe Limited
Unit A, Kings Hill Business Park
Darlaston Road, Wednesbury
West Midlands WS10 7SH UK
Telephone: +44(0)121 506 7700
Fax: +44(0)121 506 7701
Service Telephone: +44(0)121 506 7709
Service Fax: +44(0)121 506 7702
E-mail: uksales@rg-inc.com
E-mail: export@rg-inc.com

www.robertsgordon.co.uk
www.rg-inc.com

© 2013 Roberts-Gordon Europe Limited

170102UK Rev F 08/13

TABLE OF CONTENTS

SECTION 1: Heater Safety 2
1.1 Manpower Requirements 2
1.2 IP55 Protection 2
1.3 Safety Labels and Their Placement 2
SECTION 2: Installer Responsibility 4
2.1 Low Level User Instructions 4
2.2 Corrosive Chemicals 4
2.3 National Standards and Applicable Codes 4
SECTION 3: Clearances To Combustibles 5
3.1 Required Clearances to Combustibles 5
3.2 Clearances Data - Linear and Double Linear 6
3.3 Clearances Data - U-Tube 8
SECTION 4: Major Component Descriptions 10
SECTION 5: General Suspension Details 11
SECTION 6: Linear & Double Linear Heater Installation 13
6.1 Linear Standard Parts List 13
6.2 Double Linear Standard Parts List 16
6.3 Burner Tube Installation 19
6.4 Coupling and Tube Assembly 19
6.5 Tube Clamp Package Installation 21
6.6 Reflector Installation 22
6.7 Double Linear Tee Installation (For Double Linear Heaters Only) 24
SECTION 7: U-tube Heater Installation 25
7.1 U-tube Standard Parts List 25
7.2 U-tube Hanger Placement 29
7.3 Burner Tube and Fan Tube Installation 29
7.4 U-tube Support Bracket Assembly Installation 30
7.5 Coupling and Tube Assembly 31
7.6 Tube Installation 32
7.7 U-tube Installation 32
7.8 Reflector Installation 33
SECTION 8: Multiburner Configuration & Installation 35
8.1 Initial Assembly 35
SECTION 9: Burner & Fan Installation 37
9.1 Burner Installation 37
9.2 IP55 Fan Assembly 37
9.3 Linear & U-tube Fan Installation 38
9.4 Double Linear Fan Installation 38
9.5 Multiburner 83 BWLG/90 BWTL Fan Assembly (Horizontal and Vertical Outlets) 39
9.6 Condensate Drain Assembly 40
SECTION 10: Optional Heater Accessories 41
10.1 Reflector Side Extension Installation 42
10.2 U-Tube Cover Installation 43
10.3 Decorative Grille Installation 44
10.4 Protective Grille Installation 45
10.5 Sports Hall Guard Installation 46
10.6 Undershield Installation 47
10.7 Wall Mounting 48
SECTION 11: Venting and Fresh Air Supply 49
11.1 General Venting 49
11.2 Type C12 , C32 & C62 Appliance 49
11.3 Type B22 Appliance 49
11.4 Flue Installation 49
11.5 Ventilation Requirements 49
11.6 Fresh Air Supply 49
11.7 Outside Combustion Air Supply 50
11.8 Common Duct 51
SECTION 12: Gas Piping 52
SECTION 13: Wiring 54
13.1 Typical External Wiring Diagram (Linear or U-Tube) 54
13.2 Typical External Wiring Diagram (Double Linear Option 1) 55
13.3 Typical External Wiring Diagram (Double Linear Option 2) 55
13.4 Typical External Wiring Diagram (Multiburner) 55
13.5 Internal Wiring Diagram 56
SECTION 14: Operation 57
14.1 Heater Lockout Indication 57
14.2 Testing 58
14.3 Commissioning (Multiburner) 58
14.4 System Checks 58
14.5 User Instructions 58
SECTION 15: Servicing Instructions 59
15.1 Annual Procedure 59
15.2 Sealing Gaskets 59
15.3 Component Removal 59
15.4 Maintenance Checklist 60
SECTION 16: Troubleshooting 62
16.1 Troubleshooting Flow Chart (Linear, Double Linear and U-Tube) 63
16.2 Troubleshooting Flow Chart (Multiburner) 65
16.3 Manifold Gas Pressure Setting 67
SECTION 17: Replacement Parts 68
17.1 Replacement Packages 70
SECTION 18: Specifications 71
18.1 Material Specifications 71
18.2 Heater Specifications 71
18.3 Venting Specifications 71
18.4 Suspension Specifications 71
18.5 Controls Specifications 71
18.6 Environment 71
18.7 Linear Heater 72
18.8 Double Linear Heater 72
18.9 U-tube Heater 72
18.10 Burner Specifications 73

© 2013 Roberts-Gordon Europe Ltd

All rights reserved. No part of this work covered by the copyrights herein may be reproduced or copied in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping or information storage and retrieval systems - without the written permission of Roberts-Gordon Europe Ltd.

Printed in U.K.

TABLE OF FIGURES

Figure 1: Bottom and Back Panel Label Placement 3
Figure 2: Control Side Label Placement.....3
Figure 3: Linear & Double Linear, Horizontal Mounts.....6
Figure 4: Linear & Double Linear, One Side Reflector 6
Figure 5: Linear & Double Linear, Two Side Reflectors ...6
Figure 6: Linear & Double Linear, 45° Mount 6
Figure 7: Linear & Double Linear, 2 Foot Deco Grille, Protective Grille 7
Figure 8: Undershield** 7
Figure 9: Linear & Double Linear, Venting.....7
Figure 10: U-Tube, Horizontal Mount.....8
Figure 11: U-Tube, One Side Reflector.....8
Figure 12: U-Tube, Two Side Reflectors 8
Figure 13: U-Tube, Full 45° Mount.....8
Figure 14: U-Tube, Opposite 45° Tilt 9
Figure 15: U-Tube, Protective Grille.....9
Figure 16: U-Tube, Venting.....9
Figure 17: Critical Hanger Placement 12
Figure 18: Linear General Assembly Overview.....14
Figure 19: Linear Layout Overview.....15
Figure 20: Double Linear General Assembly Overview 17
Figure 21: Double Linear Layout Overview 18
Figure 22: U-tube Assembly Overview.....27
Figure 23: BLACKHEAT® HE U-tube Layout Overview 28
Figure 24: Multiburner Damper Flange Installation 35
Figure 25: Typical Manifold Layout (Linear and U-Tube Configuration).....36
Figure 26: U-tube (Horizontal).....48
Figure 27: U-tube (Angle Mounted).....48
Figure 28: Linear 48
Figure 29: Individual Flue Connection Detail.....50
Figure 30: Flue Connection Dimensions 50
Figure 31: Air Supply with Flue Configurations 51
Figure 32: Gas Connection with Stainless Steel Flex Connector.....53
Figure 33: Sequence of Operation Chart 57
Figure 34: Burner Cup Position 60
Figure 35: Linear and U-tube Specifications 73

Product Approval

ROBERTS GORDON® appliances have been tested and CE certified as complying with the essential requirements of the Gas Appliance Directive, the Low Voltage Directive, the Electromagnetic Compatibility Directive and the Machinery Directive for use on natural gas and LPG when installed, commissioned and maintained in accordance with these instructions.

These instructions refer to appliances designed to operate in the European Union.

Appliances designed for other countries (Non-European Union) are available on request.

This appliance must be installed in accordance with the local and national codes in force and used only in a sufficiently ventilated space, as specified in these instructions.

Before installation, check that the local gas distribution systems, nature of gas and pressure, and adjustment of the appliance are compatible.

SECTION 1: HEATER SAFETY

Your Safety is Important to Us!

This symbol is used throughout the manual to notify you of possible fire, electrical or burn hazards. Please pay special attention when reading and following the warnings in these sections.

Installation, service and annual inspection of heater must be done by a registered installer/contractor qualified in the installation and service of gas-fired heating equipment.

Read this manual carefully before installation, operation or service of this equipment.

This heater is designed for heating nonresidential indoor spaces. Do not install in residential spaces. These instructions, the layout drawing, local codes and ordinances, and applicable standards that apply to gas piping, electrical wiring, venting, etc. must be thoroughly understood before proceeding with the installation.

Protective gear is to be worn during installation, operation and service. Thin sheet metal parts, such as the reflector portion of the heater and the various venting components, have sharp edges. To prevent injury, the use of work gloves is recommended. The use of gloves will also prevent the transfer of body oils from the hands to the surface of the reflector.

Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

The heater must be applied and operated under the general concepts of reasonable use and installed using best building practices.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

For additional copies of the Installation, Operation and Service Manual, please contact Roberts-Gordon Europe Limited.

1.1 Manpower Requirements

To prevent personal injury and damage to the heater, two persons will be required for installation.

1.2 IP55 Protection

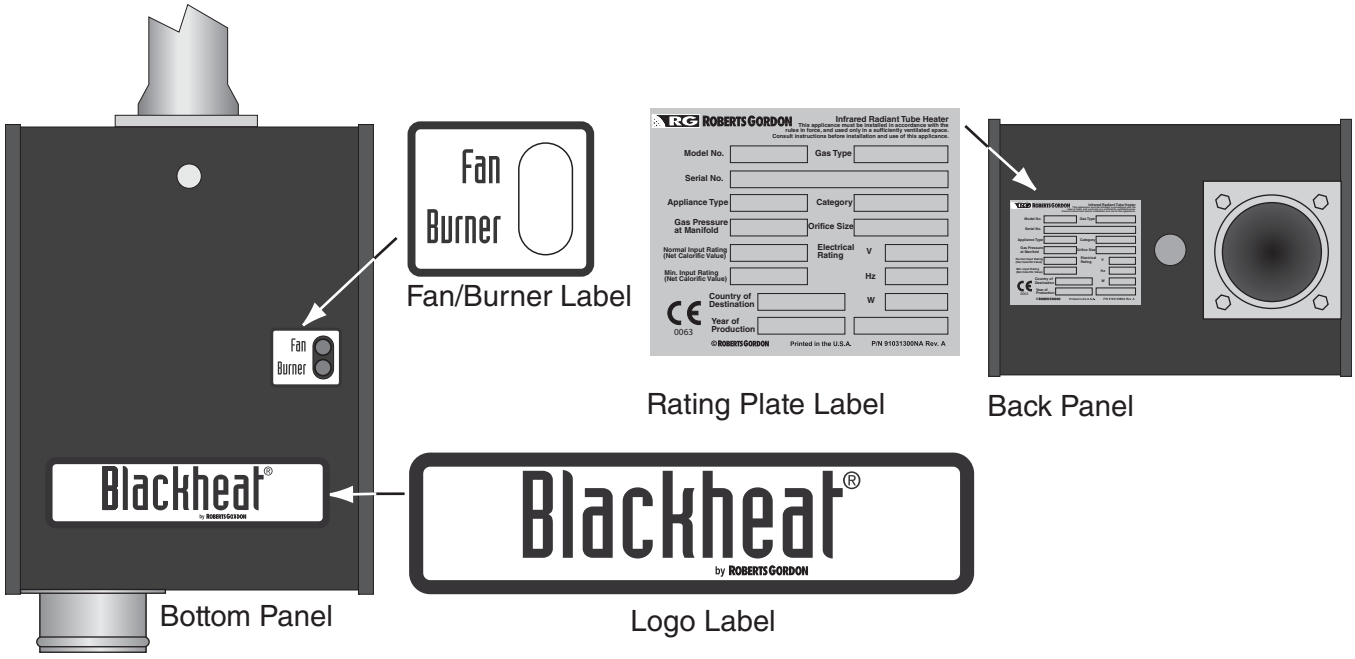
The burner is certified to protection class of IP55. This means that the internal components of the burner are protected against extreme dusty atmosphere and water jets from all sides. Outside air supply and flue are mandatory for this heater. Optional stainless steel burner box provides long life in the most corrosive applications. Always ensure that the environment to be heated is not of an explosive or flammable nature. For more information, please consult your ROBERTS GORDON® independent distributor.

In order to have trouble free performance of your heater and maintain the IP55 protection, follow all instructions in this manual, especially the replacement of sealing gaskets.

1.3 Safety Labels and Their Placement

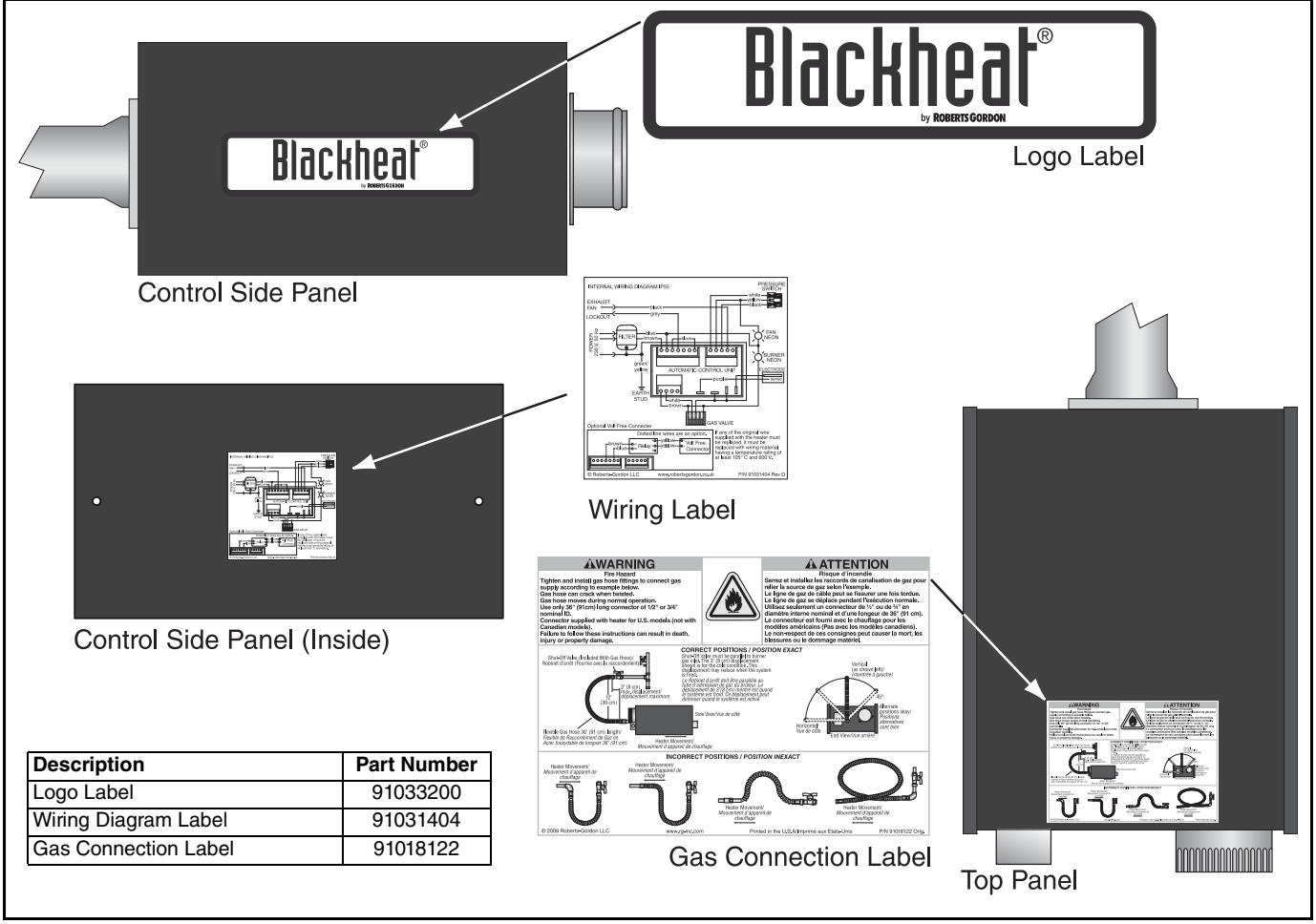
Product safety signs or labels should be replaced by the product user when they are no longer legible. Please contact Roberts-Gordon Europe Limited or your ROBERTS GORDON® independent distributor to obtain replacement signs or labels. *See Page 3, Figure 1 through Page 3, Figure 2*.

Figure 1: Bottom and Back Panel Label Placement



Description	Part Number
Logo Label	91033200
Rating Plate Label	91031300
Fan/Burner Label	91033300

Figure 2: Control Side Label Placement



Description	Part Number
Logo Label	91033200
Wiring Diagram Label	91031404
Gas Connection Label	91018122

SECTION 2: INSTALLER RESPONSIBILITY

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Roberts-Gordon Europe Limited recommends the installer contact a local Building Inspector or Fire Marshal for guidance.
- To use the information given in a layout drawing and in the manual together with the cited codes and regulations to perform the installation.
- To install the heater in accordance with the clearances to combustibles.
- To furnish all needed materials not furnished as standard equipment.
- To plan location of supports.
- To provide access to burners for servicing on all sides, for burner removal.
- To provide the owner with a copy of this Installation, Operation and Service Manual.
- To never use heater as support for ladder or other access equipment and never hang or suspend anything from heater.
- To ensure there is adequate air circulation around the heater and to supply air for combustion, ventilation and distribution in accordance with local codes.
- To safely and adequately install heater using materials with a minimal working load of 33 kg.
- To ensure the heater is placed in an approved application.

2.1 Low Level User Instructions

In all situations, clearances to combustibles must be maintained. Signs should be posted in storage areas to specify the maximum stacking height of items placed below heater to maintain required clearances to combustibles. Minimum clearances must be maintained from vehicles parked below the heater. Caution should be used when running the system near combustible materials such as wood, paper, rubber, etc. Consideration should be given to partitions, storage racks, hoists, building construction, etc.

A laminated wall tag is available for the heater as a permanent reminder of the safety instructions and the importance of the required clearances to combustibles. Please contact Roberts-Gordon Europe Limited or your ROBERTS GORDON® independent distributor to obtain the wall tag. Affix the tag by peeling off the backing of the adhesive strips on the rear surface and position the tag on a wall near the heater (e.g. thermostat).

A copy of the wall tag (P/N 91037912) is illustrated on the back cover. This copy of the wall tag can be affixed on the wall near the heater. Know your model number and installed configuration. Model number and installed configuration are found on the burner and in the Installation, Operation and Service Manual. Write the largest clearance dimensions with permanent ink according to your model number and configuration in the open spaces on the tag.

2.2 Corrosive Chemicals

⚠ CAUTION

Product Damage Hazard

Do not use heater in area containing corrosive chemicals.

Refer to appropriate Material Safety Data Sheets (MSDS).

Failure to follow these instructions can result in product damage.

Roberts-Gordon Europe Limited cannot be responsible for ensuring that all appropriate safety measures are undertaken prior to installation; this is entirely the responsibility of the installer. It is essential that the contractor, the sub-contractor, or the owner identifies the presence of combustible materials, corrosive chemicals or halogenated hydrocarbons* anywhere in the premises.

** **Halogenated Hydrocarbons** are a family of chemical compounds characterized by the presence of halogen elements (fluorine, chlorine, bromine, etc.). These compounds are frequently used in refrigerants, cleaning agents, solvents, etc. If these compounds enter the air supply of the burner, the lifespan of the heater components will be greatly reduced. An outside air supply must be provided to the burners whenever the presence of these compounds is suspected. Warranty will be invalid if the heater is exposed to halogenated hydrocarbons.*

2.3 National Standards and Applicable Codes

All appliances must be installed in accordance with the latest revision of the applicable standards and national codes. This refers also to the electric, gas and venting installation. Note: Additional standards for installations in Public Garages, Aircraft Hangars, etc. may be applicable.

The heater must not be operated in environmental temperatures below 0° C.

SECTION 3: CLEARANCES TO COMBUSTIBLES

⚠ WARNING

Fire Hazard

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.

3.1 Required Clearances to Combustibles

Clearances are the required distances that combustible objects must be away from the heater to prevent fire hazards. Caution should be used when running the system near combustibles. Combustibles are materials that may catch on fire and include common items such as wood, paper, rubber, fabric, etc. **Maintain clearances to combustibles at all times for safety.**

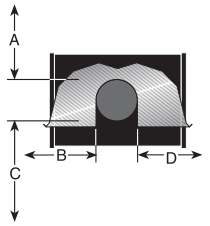
Clearances for all heater models are located *on Page 6, Figure 3 through Page 9, Figure 16* in this manual. Check the clearances on each burner for the model heater being installed to make sure the product is suitable for your application and the clearances are maintained. Read and follow the safety guidelines below:

- Keep petrol or other combustible materials including flammable objects, liquids, dust or vapours away from this heater or any other appliance.
- Do not spray aerosols in the vicinity of this appliance.
- The stated clearances to combustibles represents a surface temperature of 50° C (90° F) above room temperature. Building materials with a low heat tolerance (such as plastics, vinyl siding, canvas, tri-ply, etc) may be subject to degradation at lower temperatures. It is the installer's responsibility to assure that adjacent materials are protected from degradation.
- Maintain clearances from heat sensitive equipment and workstations.
- Maintain clearances from vehicles parked below the heater.
- Maintain clearances from swinging and overhead doors, overhead cranes, vehicle lifts, partitions, storage racks, hoists, building construction, etc.
- In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain required clearances from the heater to the combustibles. Signs must be posted adjacent to the heater thermostat. In the absence of a thermostat, signs must be posted in a conspicuous location.
- Consult local Building Inspector, Fire Insurance Carrier or other authorities for approval of proposed installation when there is a possibility of exposure to combustible airborne materials or vapours.
- Hang heater in accordance to the minimum suspension requirements *on Page 11, Section 5*.
- If the radiant tubes must pass through the building structure, be sure that adequate sleeving and fire stop is installed to prevent scorching and/or fire hazard.

3.2 Clearances Data - Linear and Double Linear

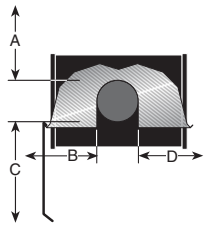
NOTE:
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
3. All measurements are in millimeters.

FIGURE 3: LINEAR & DOUBLE LINEAR, HORIZONTAL MOUNTS



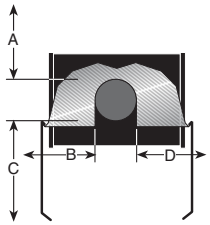
Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
A	150	150	150	150	150	150	200	200
B	890	970	970	1020	1170	1220	1280	1330
C	1570	1650	1650	1780	1930	1970	2010	2080
D	890	970	970	1020	1170	1220	1280	1330

FIGURE 4: LINEAR & DOUBLE LINEAR, ONE SIDE REFLECTOR



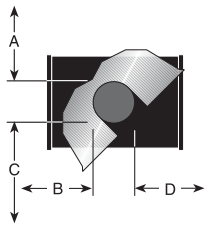
Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
A	150	150	150	150	150	150	200	200
B	230	230	230	230	230	230	230	230
C	1580	1760	1760	1930	2090	2130	2160	2240
D	1200	1380	1380	1500	1660	1710	1760	1860

FIGURE 5: LINEAR & DOUBLE LINEAR, TWO SIDE REFLECTORS



Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
A	150	150	150	150	150	150	200	200
B	590	640	640	690	820	860	890	1020
C	1660	1810	1810	1960	2110	2160	2210	2320
D	590	640	640	690	820	860	890	1020

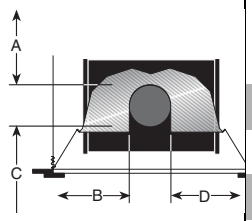
FIGURE 6: LINEAR & DOUBLE LINEAR, 45° MOUNT



Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
A	200	200	200	250	250	275	300	300
B	200	200	200	200	200	200	200	200
C	1500	1660	1660	1860	1960	2030	2110	2160
D	1370	1520	1520	1630	1750	1820	1880	2000

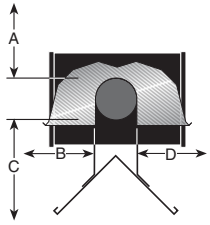
NOTE:
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
3. All measurements are in millimeters.

FIGURE 7: LINEAR & DOUBLE LINEAR, 2 FOOT DECO GRILLE, PROTECTIVE GRILLE



Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
A	150	150	150	150	150	150	200	200
B	890	970	970	1020	1170	1220	1280	1330
C	1570	1650	1650	1780	1930	1970	2010	2080
D	890	970	970	1020	1170	1220	1280	1330

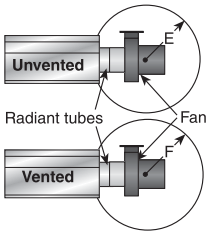
FIGURE 8: UNDERSHIELD**



Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
A	150	150	150	150	150	150	-	-
B	990	1020	1270	1270	1370	1400	-	-
C	840	965	1120	1120	1220	1270	-	-
D	990	1020	1270	1270	1370	1400	-	-

** When installed in the first 3 m.

FIGURE 9: LINEAR & DOUBLE LINEAR, VENTING



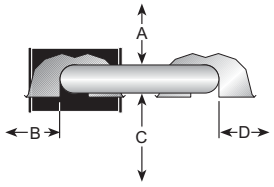
Model	HE15ST HE30DL	HE20ST HE40DL	HE25ST HE50DL	HE30ST HE60DL	HE35ST HE70DL	HE40ST	HE45ST	HE50ST
E	1000	1000	1000	1000	1000	1000	1000	1000
F	500	500	500	500	500	500	500	500

3.3 Clearances Data - U-Tube

NOTE:
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
3. All measurements are in millimeters.
4. Add 60 mm clearance to uncovered u-tube.

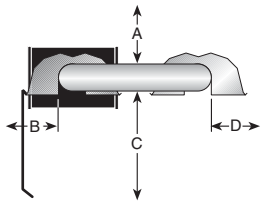
.

FIGURE 10: U-TUBE, HORIZONTAL MOUNT



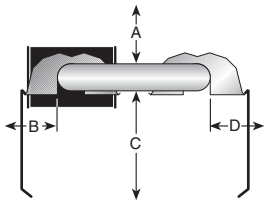
Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
A	150	150	150	150	150	150	200	200
B	890	970	970	1020	1170	1220	1270	1380
C	1580	1730	1730	1910	1980	2050	2110	2210
D	760	940	940	1000	1090	1150	1200	1300

FIGURE 11: U-TUBE, ONE SIDE REFLECTOR



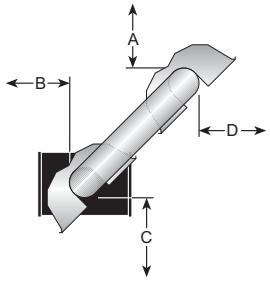
Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
A	150	150	150	150	150	150	200	200
B	230	230	230	230	230	230	230	230
C	1580	1760	1760	1930	2090	2130	2160	2240
D	1200	1380	1380	1500	1660	1710	1760	1860

FIGURE 12: U-TUBE, TWO SIDE REFLECTORS



Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
A	150	150	150	150	150	150	200	200
B	590	640	640	690	820	860	890	1020
C	1660	1810	1810	1960	2110	2160	2210	2320
D	590	640	640	690	820	860	890	1020

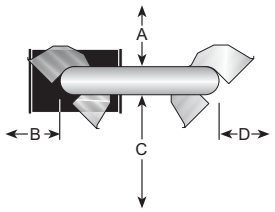
FIGURE 13: U-TUBE, FULL 45° MOUNT



Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
A	200	200	200	200	200	200	200	200
B	200	200	200	200	200	200	200	200
C	1500	1650	1650	1860	1960	2040	2110	2160
D	1070	1170	1170	1320	1550	1620	1680	1780

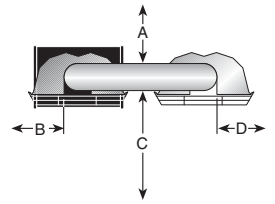
NOTE:
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
3. All measurements are in millimeters.
4. Add 60 mm clearance to uncovered u-tube.

FIGURE 14: U-TUBE, OPPOSITE 45° TILT



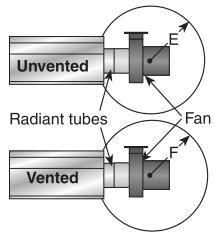
Model	HE15U	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
A	200	200	200	250	250	275	300	300
B	1370	1530	1530	1630	1780	1830	1880	1930
C	1500	1650	1650	1860	1960	2040	2110	2160
D	560	560	560	560	560	560	560	560

FIGURE 15: U-TUBE, PROTECTIVE GRILLE



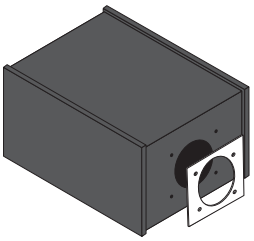
Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
A	150	150	150	150	150	150	200	200
B	890	970	970	1020	1170	1220	1270	1380
C	1580	1730	1730	1910	1980	2050	2110	2210
D	760	940	940	1000	1090	1150	1200	1300

FIGURE 16: U-TUBE, VENTING



Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
E	1000	1000	1000	1000	1000	1000	1000	1000
F	500	500	500	500	500	500	500	500

SECTION 4: MAJOR COMPONENT DESCRIPTIONS

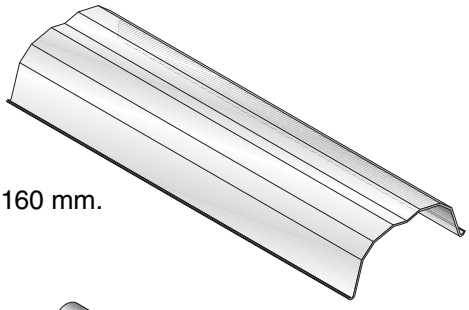


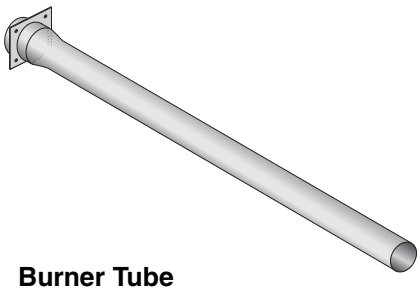
Burner (shown with Tube Gasket)

Must be installed with the flame observation window facing down.

Reflector (Aluminium or Stainless Steel)

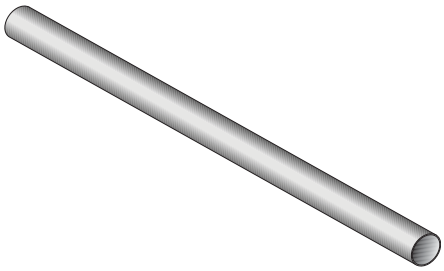
Alternate overlap as shown on overview. Minimum overlap is 160 mm.





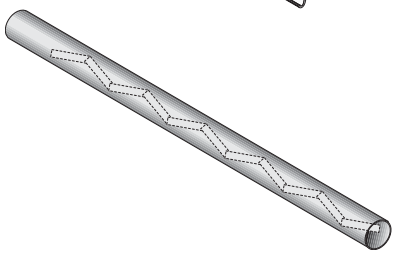
Burner Tube

Supplied in 3000 mm lengths. Burner tube is always the first tube after the burner.



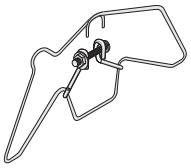
Tube

Heat treated aluminised tube supplied in 3000 mm lengths.



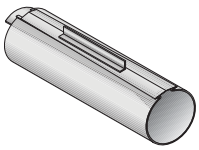
Fan Tube with Internal Swirler

Supplied in 3000 mm lengths. Fan tube is always the last tube on the heater where the fan is attached. The swirler is welded inside of the tube end.

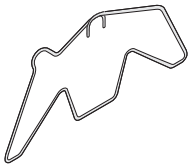


Tube and Reflector Hanger with Clamp Package

Position this hanger no more than 100 mm away from the burner assembly.

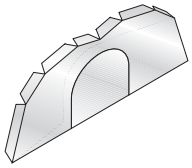


Coupling Assembly with Lock



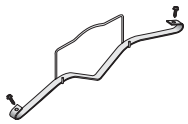
Tube and Reflector Hanger

Suspend system from these hangers.

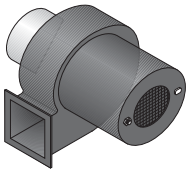


Reflector End Cap

Punch out center section to accommodate tube.

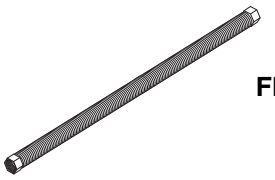


Reflector Support Strap, Wire Form & #8 x 3/4 Screw

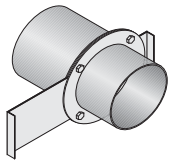


Fan Assembly (Includes Flange)

Fan assembly is attached to the last section of heat exchanger tubing (fan tube).

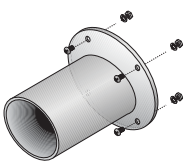


Flex Gas Line

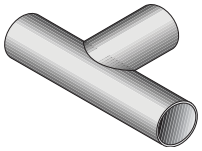


Damper Flange Assembly

For use on Multiburner Systems.



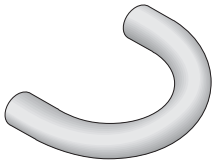
Fan Flange Assembly and Screws



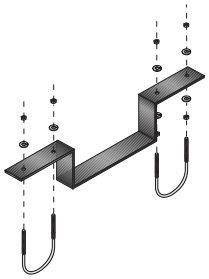
Tee Assembly

Height Adjuster

S-hook



U-tube



U-tube Support Bracket

Bow Shackle

Spring Hook

SECTION 5: GENERAL SUSPENSION DETAILS

⚠WARNING

Severe Injury Hazard

Secure burner to burner tube with bolts and lockwashers.

Hang heater with materials with a minimum working load of 75 lbs (33 kg).

Failure to follow these instructions can result in death, injury or property damage.

⚠WARNING

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

To ensure your safety, and comply with the terms of the warranty, all units must be installed in accordance with these instructions.

The gas or the electrical supply lines must not be used to support the heater.

Do not locate the gas or electrical supply lines directly over the path of the flue products from the heater.

The heater must be installed in a location that it is readily accessible for servicing.

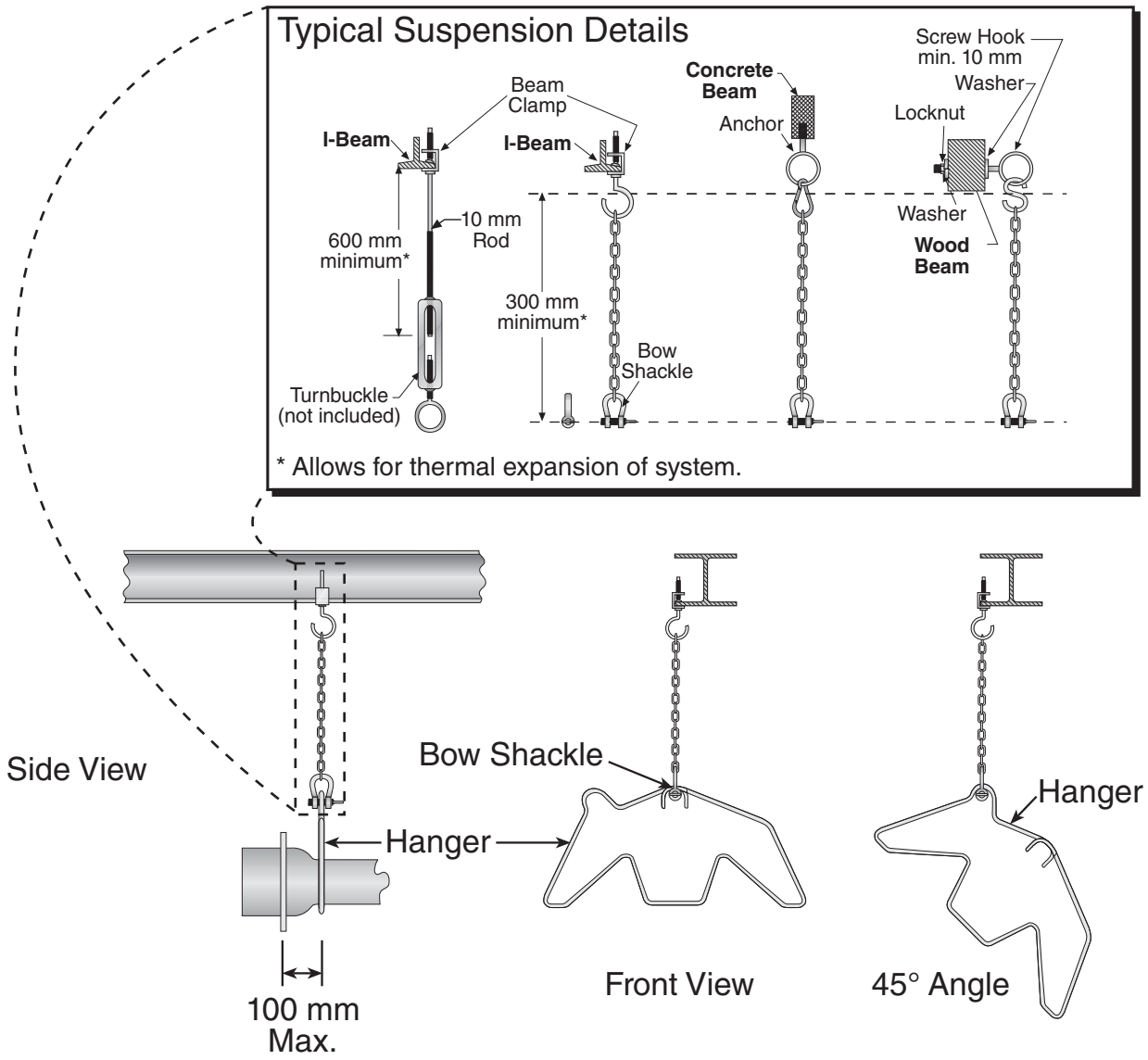
The heaters must be installed with clearances to combustibles as indicated on the rating plate and in this manual.

The minimum and maximum gas inlet pressures must be maintained as indicated on the rating plate. Typical installation configurations are shown *on Page 12, Figure 17*.

Suspension chain is not supplied as standard equipment.

NOTE: Some models may receive S-hooks (P/N 91907302) or spring hooks (P/N 91903300), rather than bow shackles.

Figure 17: Critical Hanger Placement



Description	Part Number
Burner Tube	03051100
S-hook	91907302
Spring Hook	91903300
Bow Shackle	E0007576
Tube/Reflector Hanger	03090100

For suspension angles other than shown, additional chain supports may be required.

SECTION 6: LINEAR & DOUBLE LINEAR HEATER INSTALLATION

⚠WARNING

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

The figures in this section provide a general overview of component placement in a Linear and Double Linear system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown *on Page 14, Figure 18*.

For optional reflector configurations for linear heaters *see Page 6, Figure 3 through Page 7, Figure 9*. Install appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch.

If any step is unclear, please contact Roberts-Gordon Europe Limited at +44 (0)121 506 7700.

6.1 Linear Standard Parts List

Part No.	Description	HE15ST	HE20ST	HE25ST	HE30ST	HE35ST	HE40ST	HE45ST	HE50ST
033XXXXX	Burner Assembly (Input and Fuel Varies)	1	1	1	1	1	1	1	1
07260053	Fan Package 3 IP55	1	1	1	1	1	1	1	1
07240004	Linear Package	1	1	1	1	1	1	1	1
03360115	Restrictor Plate BH HE 15	1	-	-	-	-	-	-	-
03360120	Restrictor Plate BH HE 20	-	1	-	-	-	-	-	-
03360125	Restrictor Plate BH HE 25	-	-	1	-	-	-	-	-
03360130	Restrictor Plate BH HE 30	-	-	-	1	-	-	-	-
03360135	Restrictor Plate BH HE 35	-	-	-	-	1	-	-	-
03051600	Burner Tube, 100 mm x 3048 mm	1	1	1	1	1	1	1	1
91409408	Tube, 100 mm x 3048 mm	-	1	1	2	2	2	3	3
S5127W	Fan Tube, 100 mm x 3048 mm, with 3048 mm Swirler	-	1	1	1	1	1	1	1
S5134W	Fan Tube, 100 mm x 3048 mm, with 2134 mm Swirler	1	-	-	-	-	-	-	-
01329600	Standard Coupling Assembly	1	2	2	3	3	3	4	4
01329700	Coupling Lock	1	2	2	3	3	3	4	4
02750303	Reflector, Aluminium, 2439 mm	3	4	4	6	6	6	7	7
027503SS	Reflector, Stainless Steel, 2439 mm (Optional)*	3	4	4	6	6	6	7	7
02750800	Reflector End Cap, Aluminium	2	2	2	2	2	2	2	2
027508SH	Reflector End Cap, Stainless (Optional)*	2	2	2	2	2	2	2	2
03090100	Tube and Reflector Hanger	3	4	4	5	5	5	6	6
01318901	Tube Clamp Package (including Nut, Washer & Bolt)	1	1	1	1	1	1	1	1
91908004	Wire Form	2	3	3	5	5	5	6	6
94320812	Screw #8 x 3/4, (Goes with 03050000)	4	6	6	10	10	10	12	12
03050000	Reflector Support Strap	2	3	3	5	5	5	6	6
E0007576	Bow Shackle**	3	4	4	5	5	5	6	6
91107720	U-Clip Package (20 Pieces)	1	1	1	1	1	1	1	1
S7199K	Damper Flange Assembly (For use on Multiburner Systems)	1 Per Heater							

** PVC coating must be removed prior to installation.*

*** Some models may receive S-hooks (P/N 91907302) or spring hooks (P/N 91903300), rather than bow shackles.*

Figure 18: Linear General Assembly Overview

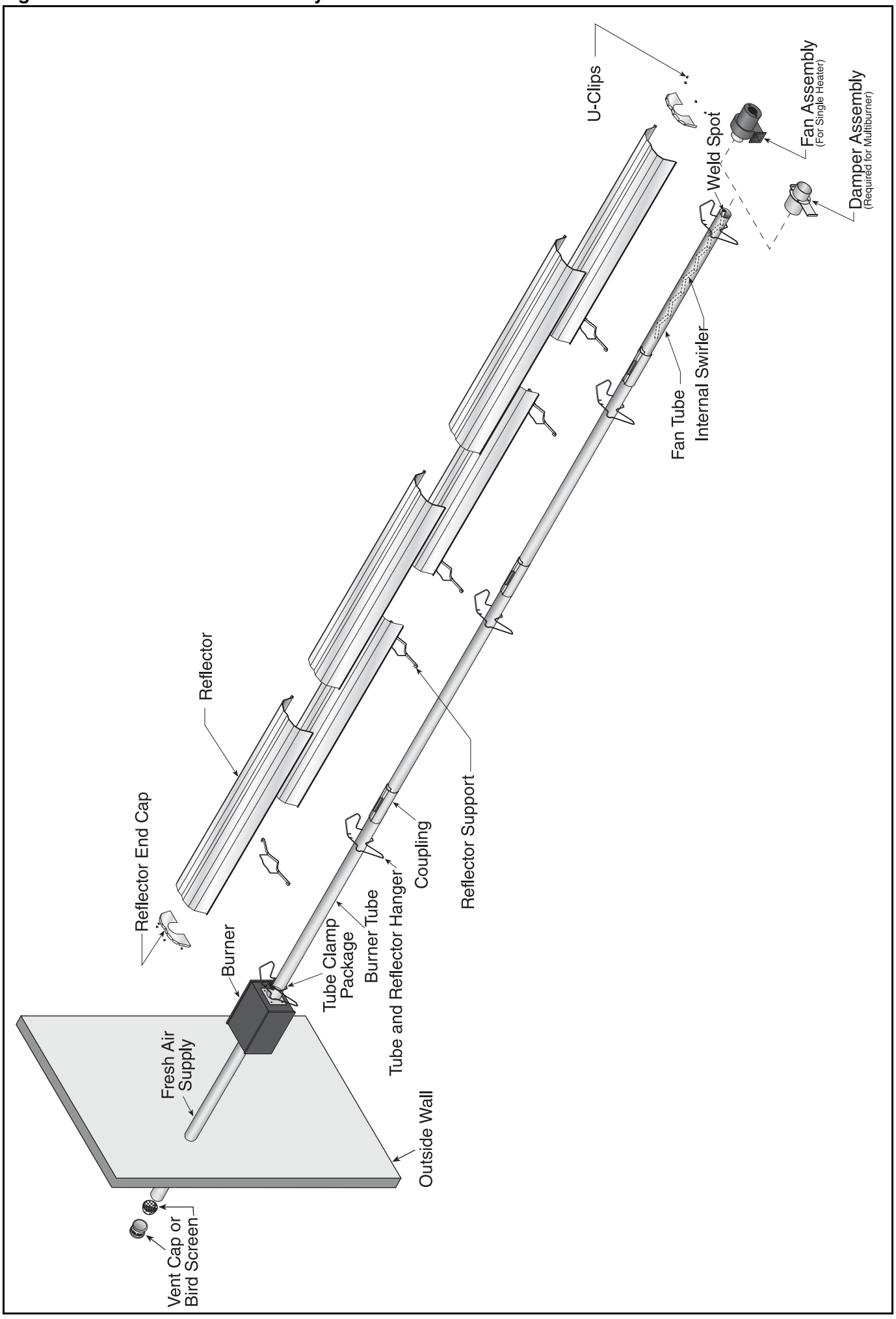
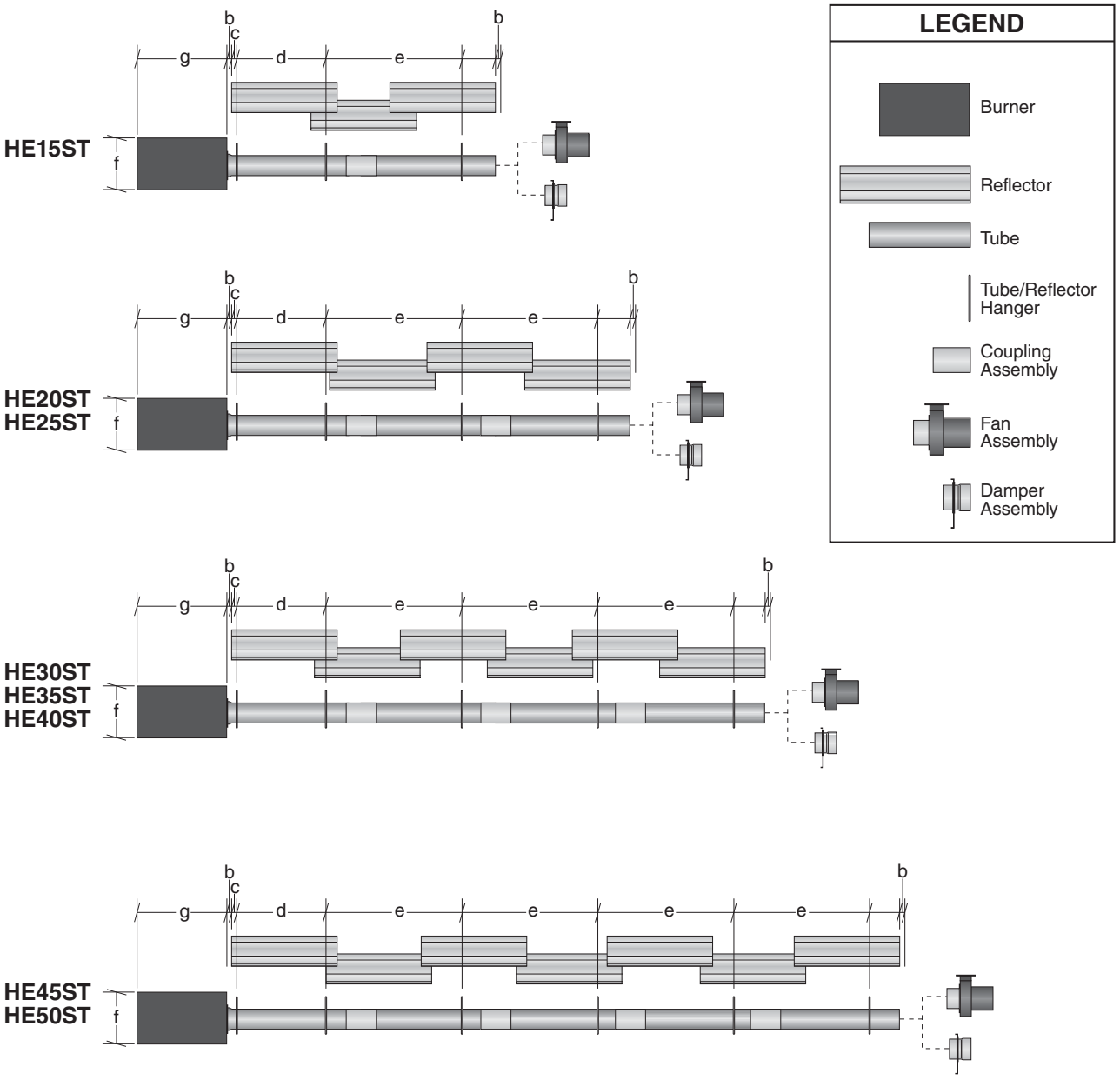


Figure 19: Linear Layout Overview



a = reflector width (not shown) - 365 mm
b = end cap to burner/fan - 50 mm
c = end cap to hanger - 50 mm
d = distance first hanger - 2290 mm
e = distance typical between hangers - 3050 mm
f = burner height - 241 mm
g = burner length - 445 mm

Model	HE15ST	HE20ST	HE25ST	HE30ST	HE35ST	HE40ST	HE45ST	HE50ST
Reflector Overlap (approx.)	700 mm	250 mm	250 mm	530 mm	530 mm	530 mm	330 mm	330 mm

6.2 Double Linear Standard Parts List

Part No.	Description	HE30DL	HE40DL	HE50DL	HE60DL	HE70DL
033XXXXX	Burner Assembly (Input and Fuel Varies)	2	2	2	2	2
07260053	Fan Package 3 IP55	1	1	1	1	1
07260004	Linear Package	2	2	2	2	2
03360130	Restrictor Plate BH HE 30	1	-	-	-	-
03051600	Burner Tube, 100 mm x 3048 mm	2	2	2	2	2
91409408	Tube, 100 mm x 3048 mm	-	2	2	4	4
S5127W	Fan Tube, 100 mm x 3048 mm, with 3048 mm Swirler	-	2	2	2	2
S5134W	Fan Tube, 100 mm x 3048 mm, with 2134 mm Swirler	2	-	-	-	-
01330203	Tee, 100 mm x 100 mm x 100 mm	1	1	1	1	1
01329600	Standard Coupling Assembly	6	8	8	10	10
01329700	Coupling Lock	6	8	8	10	10
02750303	Reflector, Aluminium, 2439 mm	6	8	8	12	12
027503SS	Reflector, Stainless Steel, 2439 mm (Optional)*	6	8	8	12	12
02750800	Reflector End Cap, Aluminium	4	4	4	4	4
027508SH	Reflector End Cap, Stainless (Optional)*	4	4	4	4	4
03090100	Tube and Reflector Hanger	6	8	8	10	10
01318901	Tube Clamp Package (including Nut, Washer & Bolt)	2	2	2	2	2
91908004	Wire Form	4	6	6	10	10
03050000	Reflector Support Strap	4	6	6	10	10
E0007576	Bow Shackle**	6	8	8	10	10
91107720	U-Clip Package (20 Pieces)	2	2	2	2	2
E0007582	Height Adjuster	6	8	8	10	10
94320812	Screw #8 x 3/4, (Goes with 03050000)	8	12	12	20	20

** PVC coating must be removed prior to installation.*

*** Some models may receive S-hooks (P/N 91907302) or spring hooks (P/N 91903300), rather than bow shackles.*

Figure 20: Double Linear General Assembly Overview

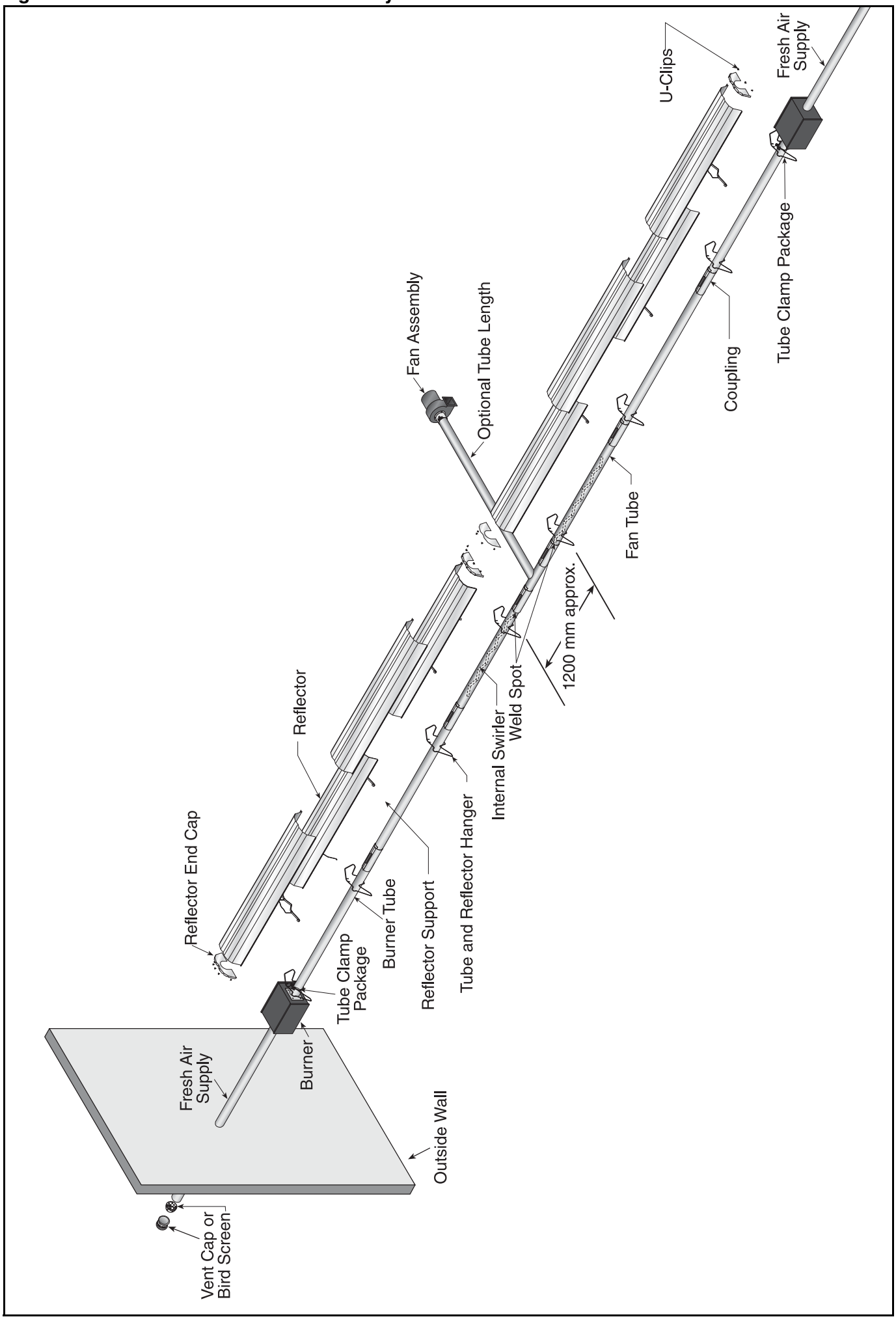
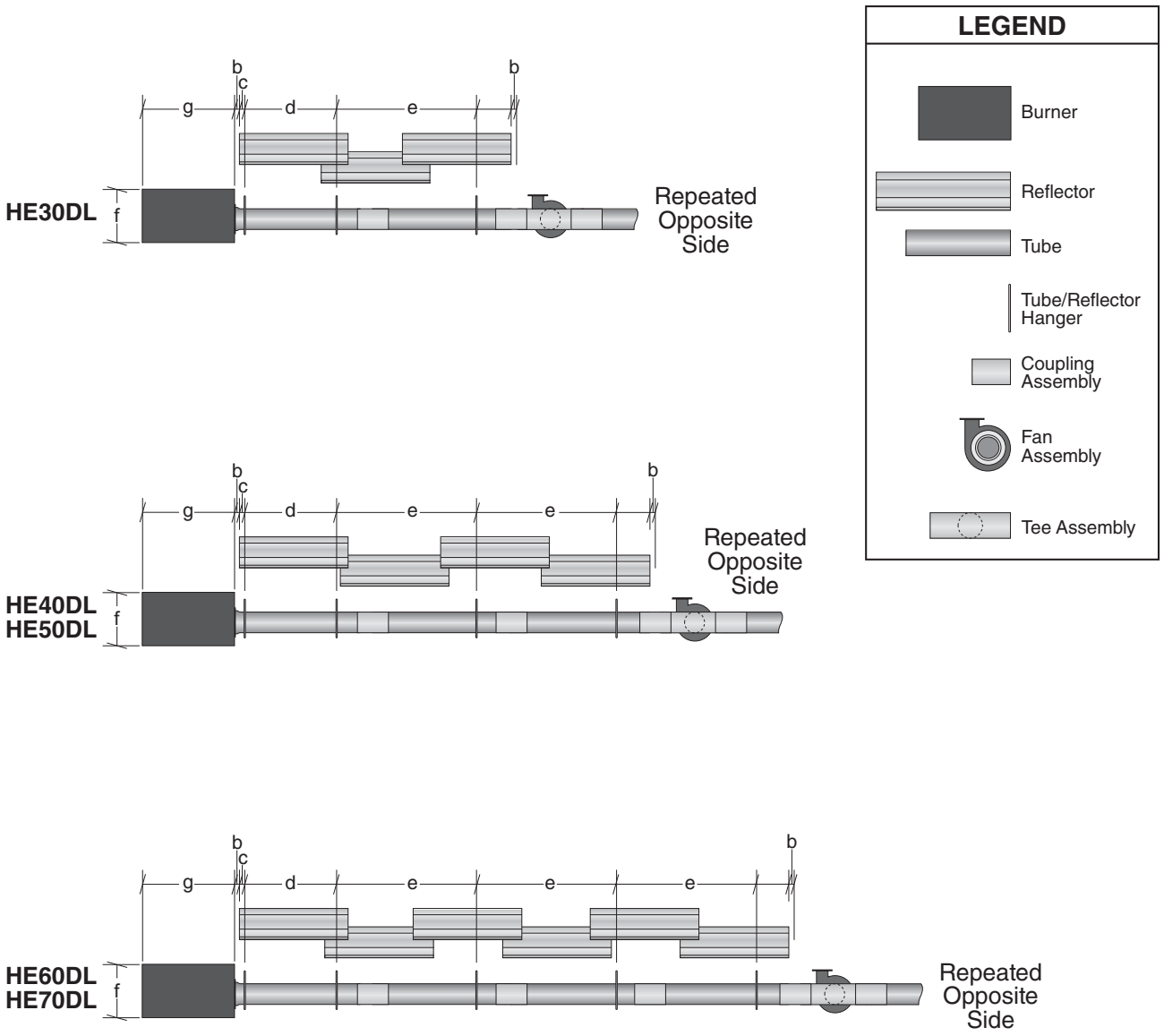


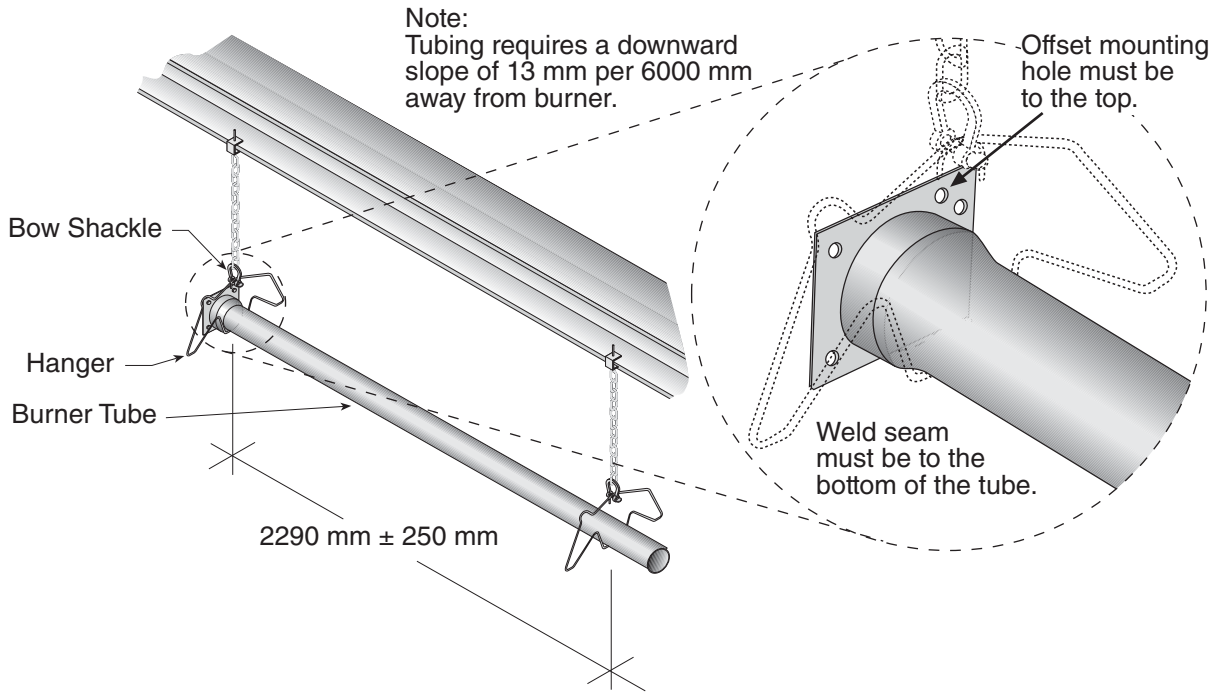
Figure 21: Double Linear Layout Overview



a = reflector width (not shown) - 365 mm
b = end cap to burner/fan - 50 mm
c = end cap to hanger - 50 mm
d = distance first hanger - 2290 mm
e = distance typical between hangers - 3050 mm
f = burner height - 241 mm
g = burner length - 445 mm

Model	HE30DL	HE40DL	HE50DL	HE60DL	HE70DL
Reflector Overlap (approx.)	700 mm	250 mm	250 mm	530 mm	530 mm

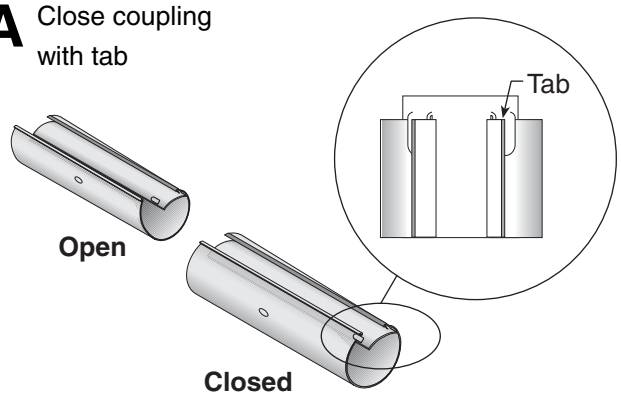
Step 6.3 Burner Tube Installation



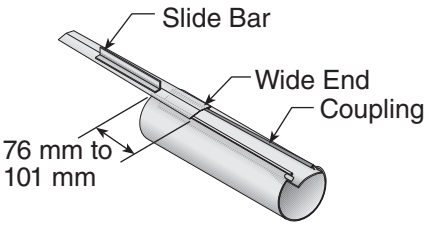
Description	Part Number
Burner Tube	03051600
Bow Shackle	E0007576
Tube/Reflector Hanger	03090100

Step 6.4 Coupling and Tube Assembly

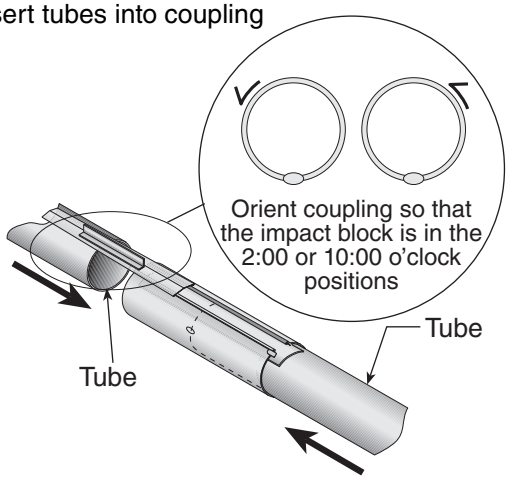
A Close coupling with tab



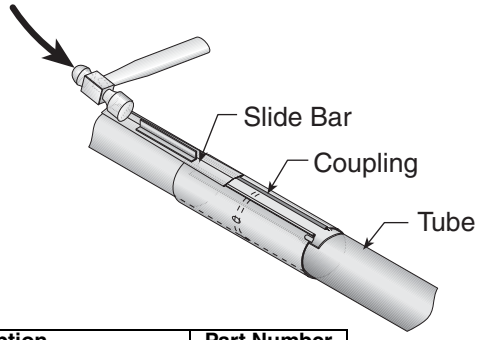
B Start slide bar/coupling lock onto coupling



C Insert tubes into coupling



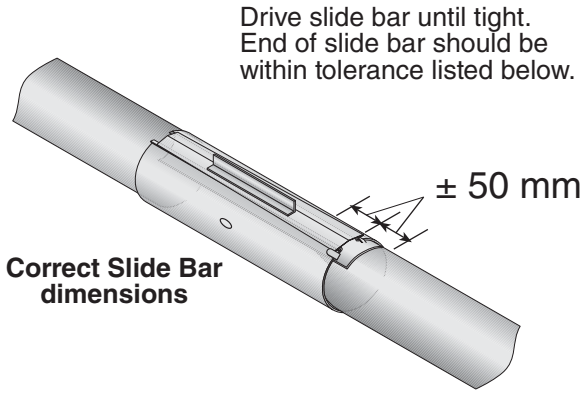
D Tighten coupling to join tubes

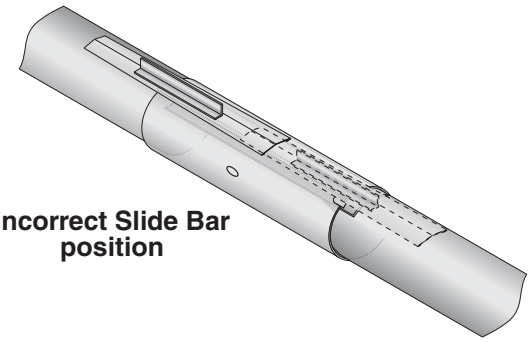


Description	Part Number
Coupling	01329600
Slide Bar/Coupling Lock	01329700
Tube	91409408

Step 6.4.1 Coupling and Tube Assembly (Continued)

Tighten slide bar as shown below.

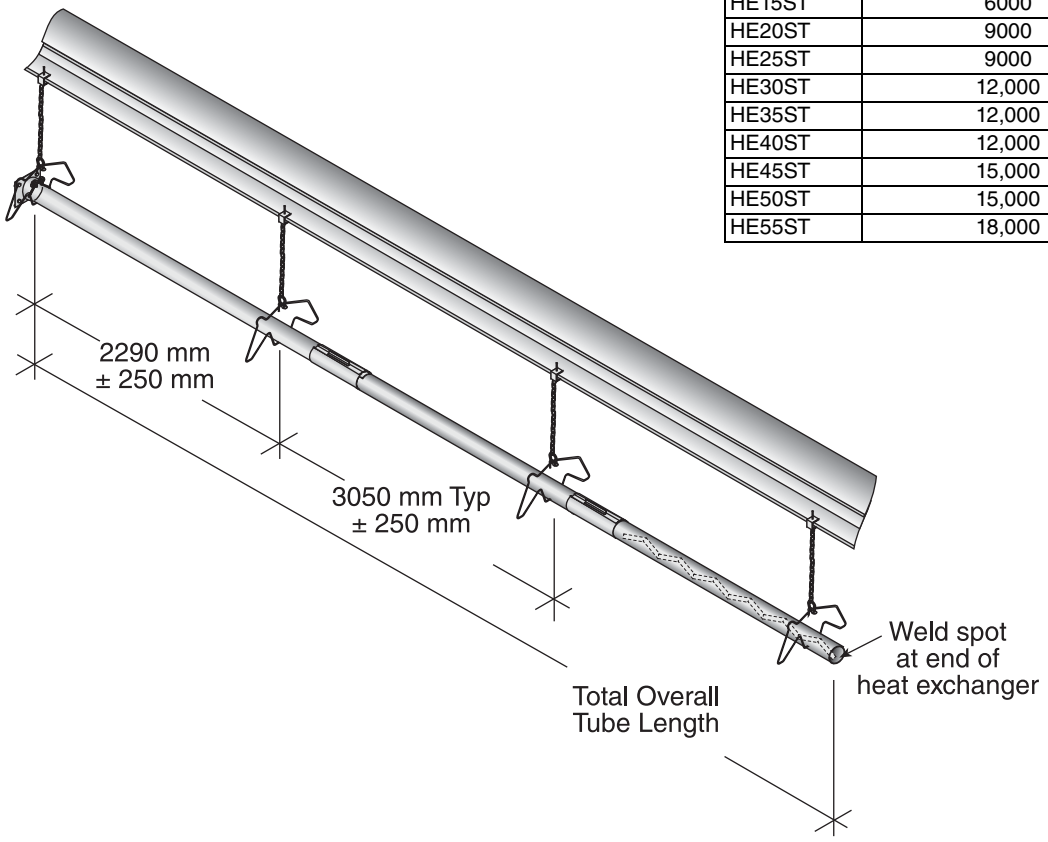




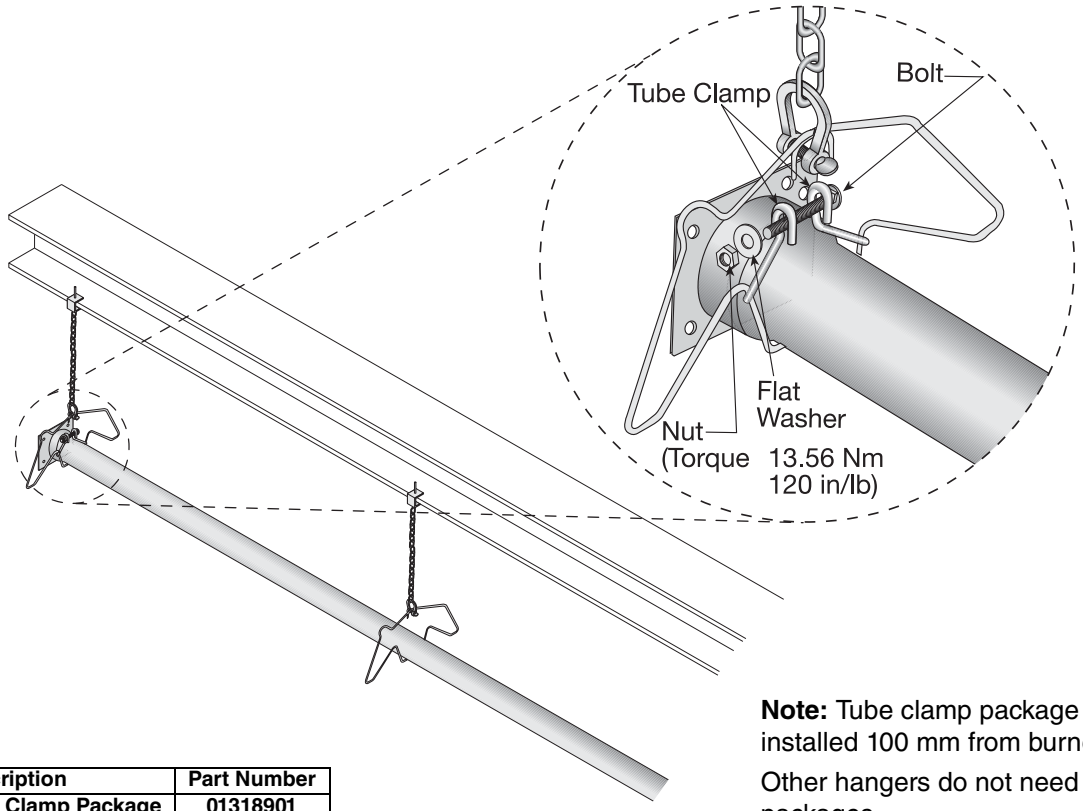
• Repeat *Step 6.4* A - D until all tubes are assembled. *See Page 20, Section 6.4.2* shown below.

Step 6.4.2 Coupling and Tube Assembly (Continued)

Model	Overall Tube Length (mm)	Number of Tubes
HE15ST	6000	2
HE20ST	9000	3
HE25ST	9000	3
HE30ST	12,000	4
HE35ST	12,000	4
HE40ST	12,000	4
HE45ST	15,000	5
HE50ST	15,000	5
HE55ST	18,000	6



Step 6.5 Tube Clamp Package Installation



Description	Part Number
Tube Clamp Package	**01318901**
Tube Clamp	01396801
Bolt	97113940
Flat Washer	95211600
Nut	92113900

Note: Tube clamp package should be installed 100 mm from burner tube plate.

Other hangers do not need tube clamp packages.

Step 6.6 Reflector Installation

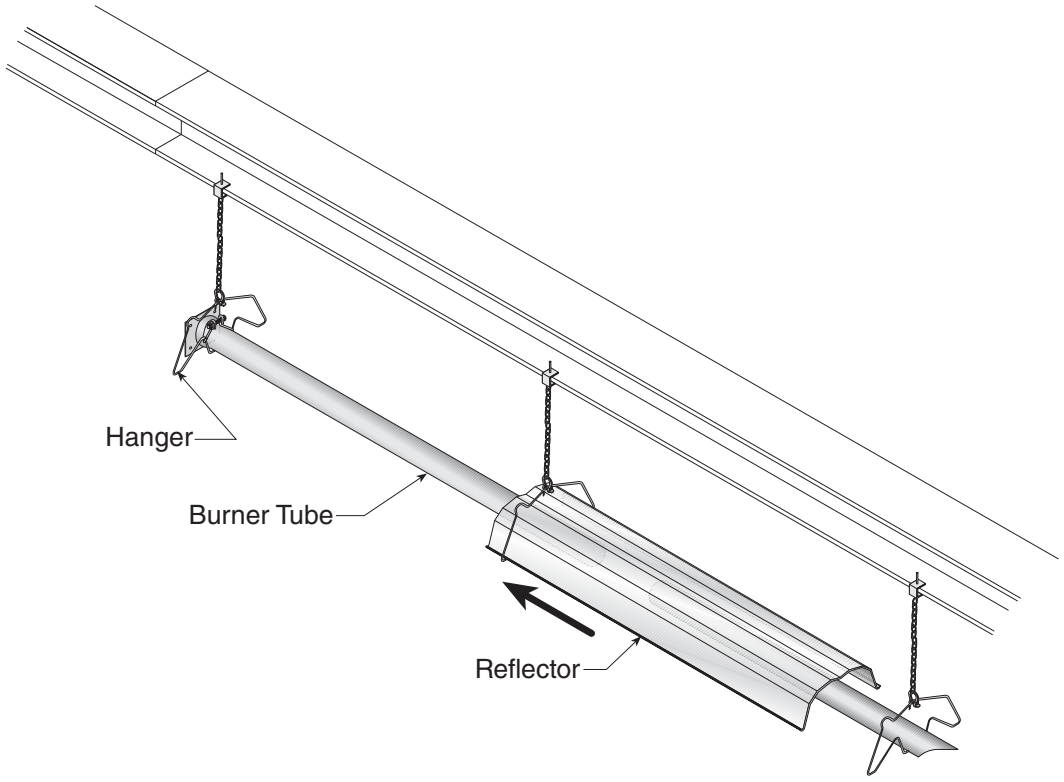
⚠ WARNING

Fire Hazard

Support reflector with reflector hanger and support strap.

Reflector must not touch tube.

Failure to follow these instructions can result in death, injury or property damage.



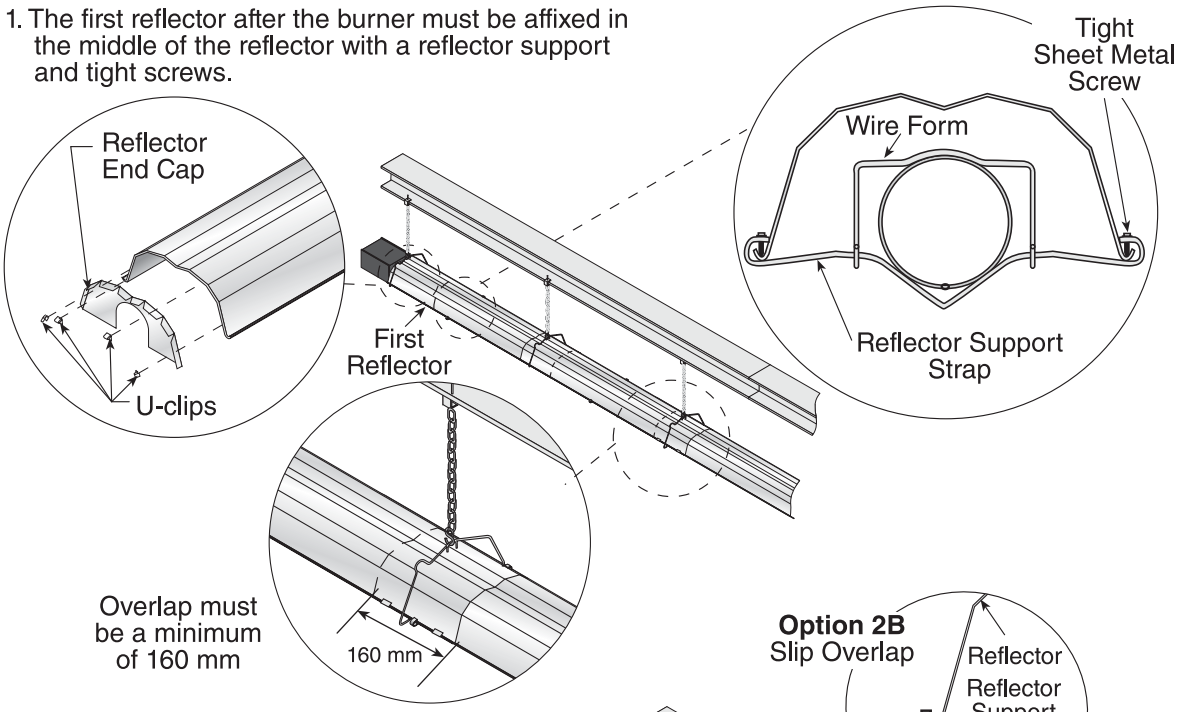
Description	Part Number
Tube/Reflector Hanger	03090100
Burner Tube	03051600
Reflector	02750303

Step 6.6.1 Reflector, U-clip and Reflector Support Installation

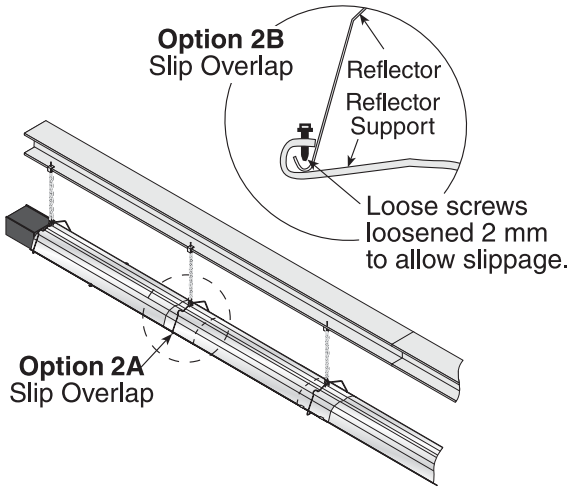
The pictorial drawings of the heater construction in *Section 6* are schematic only and provide a general guideline of where hangers, reflector supports and u-clips are to be installed.

To ensure proper expansion and contraction movement of the reflectors, a combination of u-clips and reflector supports are used. The positioning of reflector supports and u-clips depend on the individual installation. Use either pop rivets or sheet metal screws instead of u-clips when installing end caps and joint pieces in areas where impact and high wind may be a factor. The following rules must be observed:

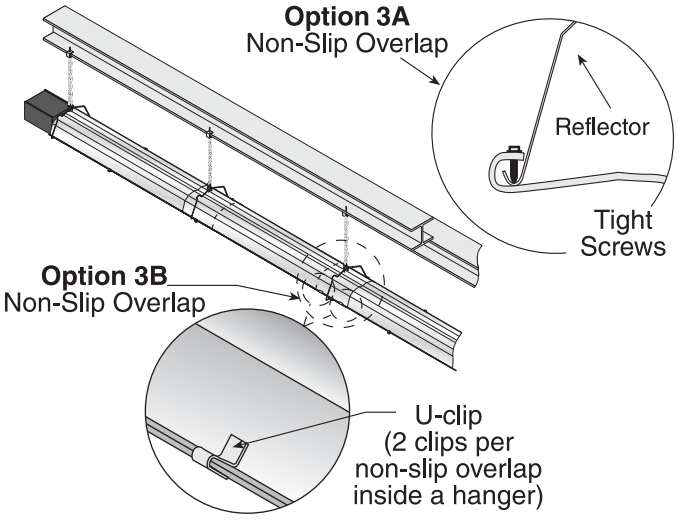
1. The first reflector after the burner must be affixed in the middle of the reflector with a reflector support and tight screws.



2. The overlap at the first and second reflector is a slip overlap. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
   a.) both reflectors lay inside a hanger. (no reflector support needed).
   b.) using a reflector support with loose screws at the reflector overlap.

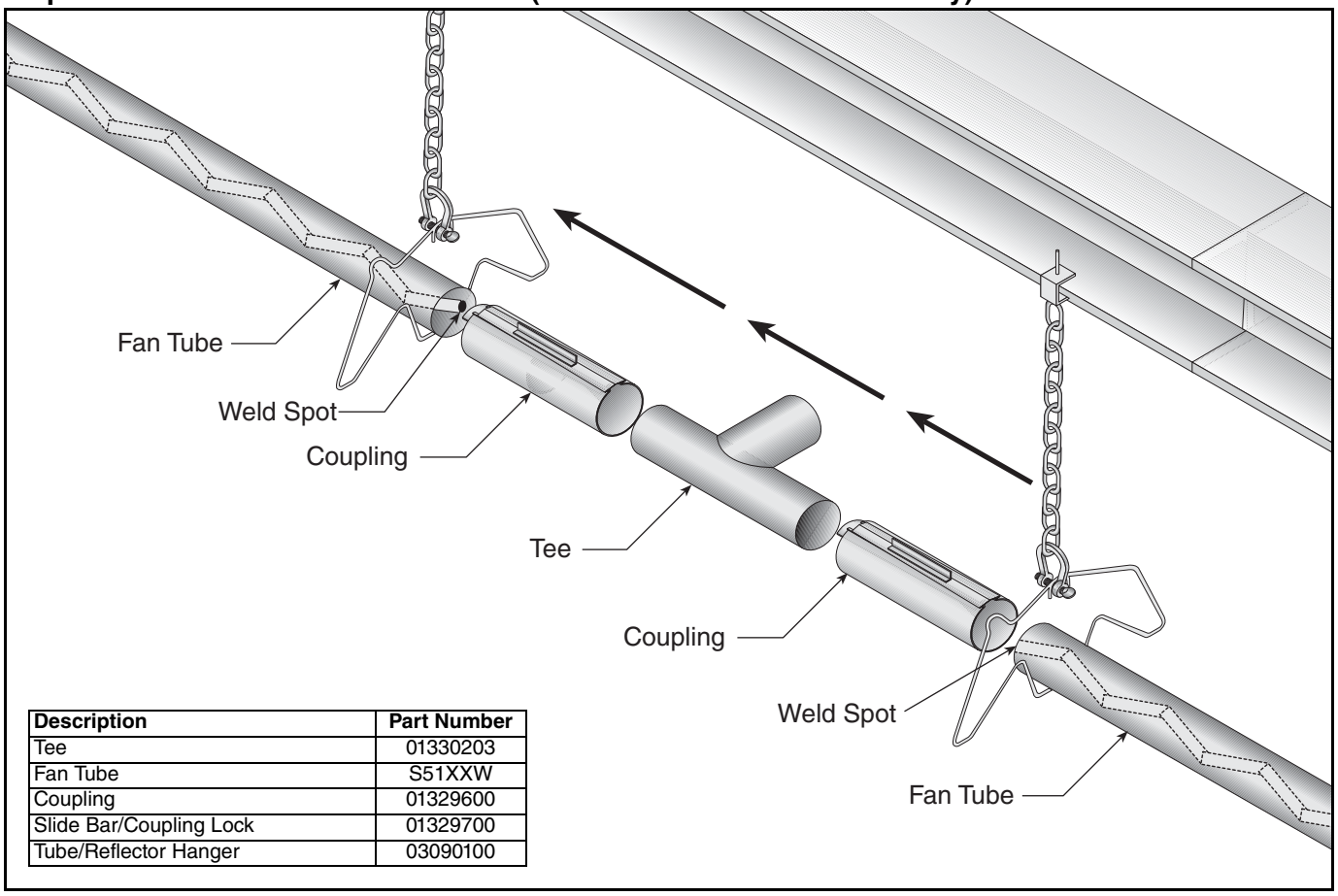


3. The remaining reflector overlaps require a non-slip overlap connection. To affix the reflectors together in a non-slip overlap either:
   a.) use reflector support and tight screws.
   b.) if both reflectors lay inside a hanger, u-clips or sheet metal screws may be used.
   This section of three reflectors joined together must be affixed to the tube with at least one reflector support with tight screws.



Description	Part Number
Reflector Support Package	**03050010**
Wire Form	91908004
Reflector Support Strap	03050000
Screw #8 x 3/4	94320812
U-clip Package	91107720
Reflector End Cap	027508XX

Step 6.7 Double Linear Tee Installation (For Double Linear Heaters Only)



Description	Part Number
Tee	01330203
Fan Tube	S51XXW
Coupling	01329600
Slide Bar/Coupling Lock	01329700
Tube/Reflector Hanger	03090100

SECTION 7: U-TUBE HEATER INSTALLATION

⚠ WARNING

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

The figures in this section provide a general overview of component placement in a u-tube system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown *on Page 27, Figure 22*.

For optional reflector configurations for u-tube heaters, *see Page 8, Figure 10 through Page 9, Figure 16*. Install appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch.

If any step is unclear, please contact Roberts-Gordon Europe Limited at +44 (0)121 506 7700.

7.1 U-tube Standard Parts List

Part No.	Description	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
033XXXXX	Burner Assembly (Input and Fuel Varies)	1	1	1	1	1	1	1	1
07260053	Fan Package 3 IP55	1	1	1	1	1	1	1	1
03360115	Restrictor Plate BH HE 15	1	-	-	-	-	-	-	-
03360120	Restrictor Plate BH HE 20	-	1	-	-	-	-	-	-
03360125	Restrictor Plate BH HE 25	-	-	1	-	-	-	-	-
03360130	Restrictor Plate BH HE 30	-	-	-	1	-	-	-	-
03360135	Restrictor Plate BH HE 35	-	-	-	-	1	-	-	-
03051600	Burner Tube, 100 mm x 3048 mm	1	1	1	1	1	1	1	1
91409408	Tube, 100 mm x 3048 mm	-	-	-	2	2	2	2	2
91409423	Tube, 100 mm x 1524 mm	-	2	2	-	-	-	2	2
S5127W	Fan Tube, 100 mm x 3048 mm, with 3048 mm Swirler	-	1	1	1	1	1	1	1
S5134W	Fan Tube, 100 mm x 3048 mm, with 2134 mm Swirler	1	-	-	-	-	-	-	-
01335901	U-tube	1	1	1	1	1	1	1	1
01329600	Standard Coupling Assembly	2	4	4	4	4	4	6	6
01329700	Coupling Lock	2	4	4	4	4	4	6	6
02750303	Reflector, Aluminium, 2439 mm	4	4	4	6	6	6	8	8
027503SS	Reflector, Stainless Steel, 2439 mm (Optional)*	4	4	4	6	6	6	8	8
02750800	Reflector End Cap, Aluminium	4	4	4	4	4	4	4	4
027508SH	Reflector End Cap, Stainless (Optional)*	4	4	4	4	4	4	4	4
03090100	Tube and Reflector Hanger	4	6	6	6	6	6	8	8
01318901	Tube Clamp Package (including Nut, Washer & Bolt)	1	1	1	1	1	1	1	1
91908004	Wire Form	2	4	4	4	4	4	6	6
03050000	Reflector Support Strap	2	4	4	4	4	4	6	6
03020501	U-tube Support Bracket	1	1	1	1	1	1	1	1
E0007576	Bow Shackle**	4	6	6	6	6	6	8	8
91107720	U-clip Package (20 Pieces)	2	2	2	2	2	2	2	2
91912501	U-bolt M6	2	2	2	2	2	2	2	2
C0090B	Nut M6	6	6	6	6	6	6	6	6

96411500	Lockwasher 6mm	6	6	6	6	6	6	6	6
94320812	Screw #8 x 3/4, (Goes with 03050000)	4	8	8	8	8	8	12	12
S7199K	Damper Flange Assembly (For use on Multiburner Systems)	1 Per Heater							

**PVC coating must be removed prior to installation.*
***Some models may receive S-hooks (P/N 91907302) or spring hooks (P/N 91903300), rather than bow shackles.*

Figure 22: U-tube Assembly Overview

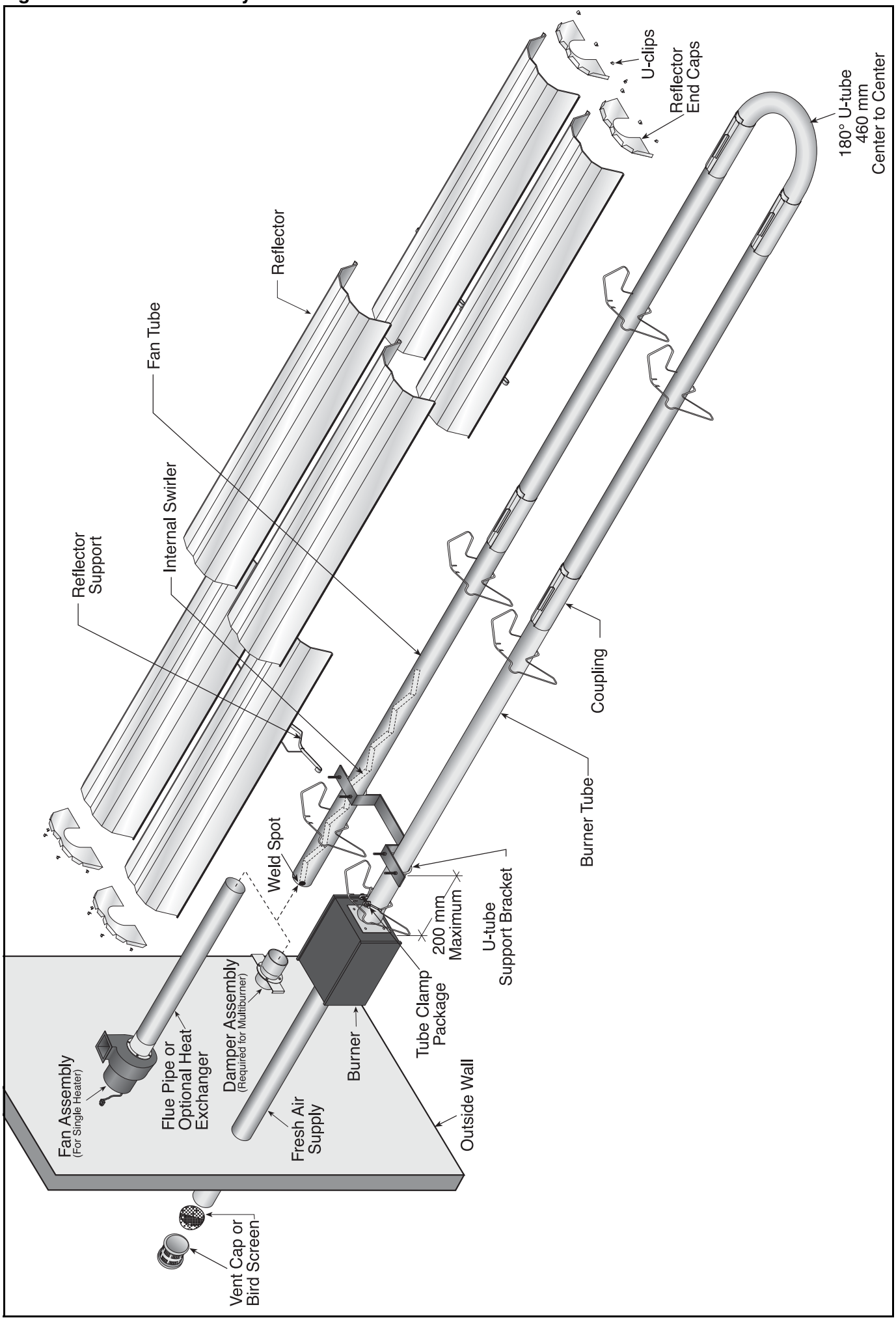
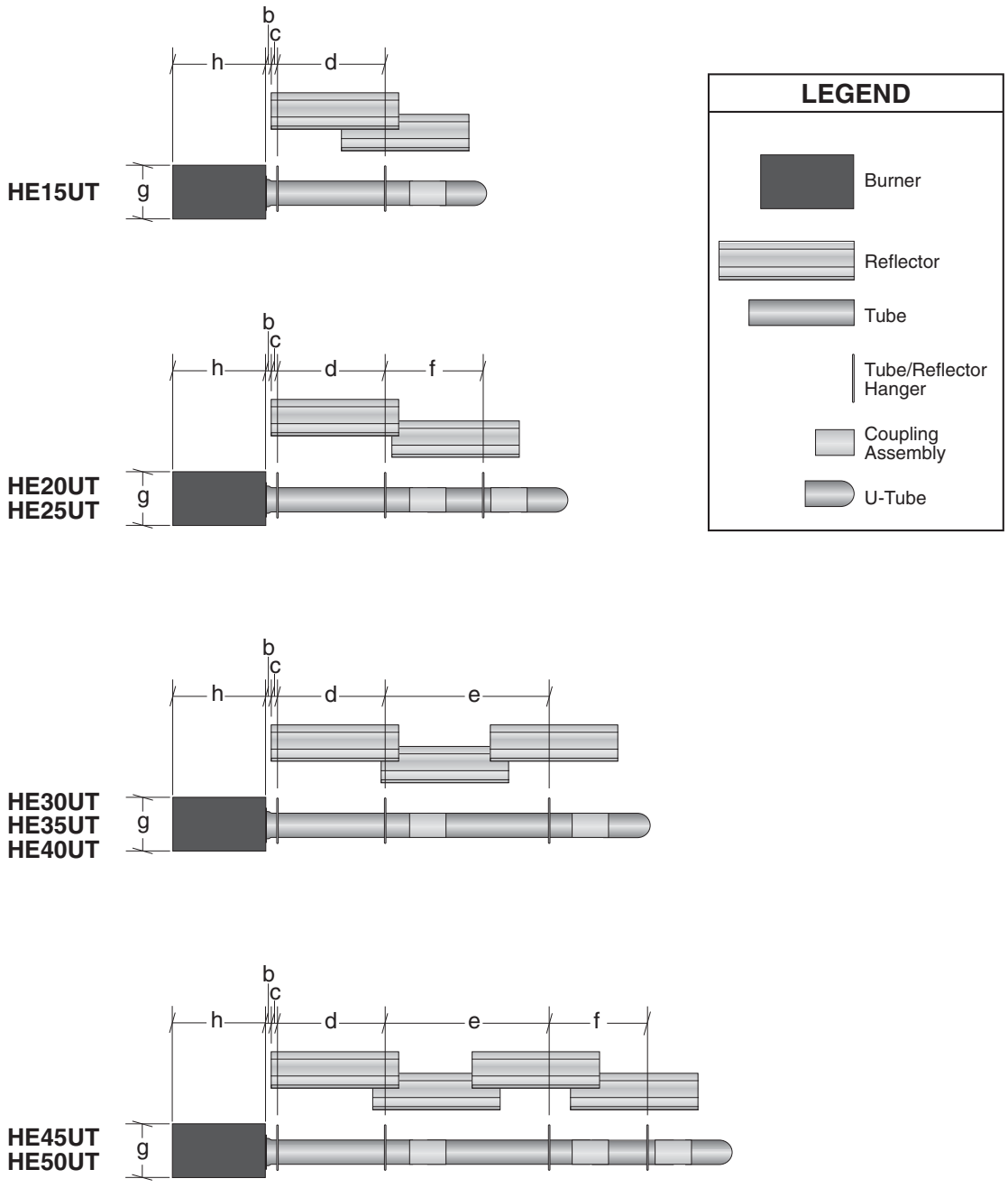


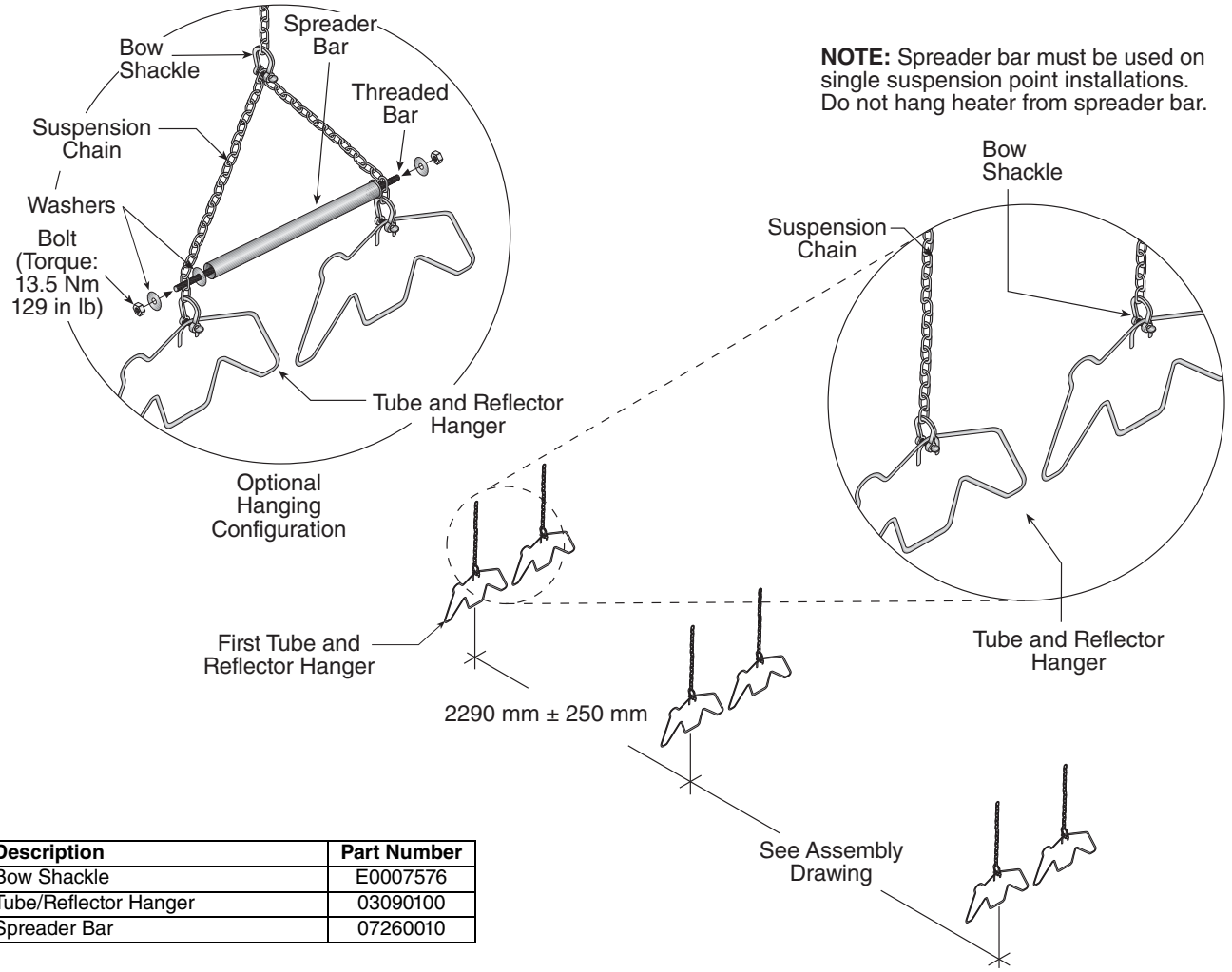
Figure 23: BLACKHEAT® HE U-tube Layout Overview



a = overall width (not shown) - 850 mm
b = end cap to burner/fan - 50 mm
c = end cap to hanger - 50 mm
d = distance first hanger - 2290 mm
e = distance typical between hangers - 3050 mm
f = distance between last full tube hanger and half tube hanger - 1900 mm
g = burner height - 241 mm
h = burner length - 445 mm

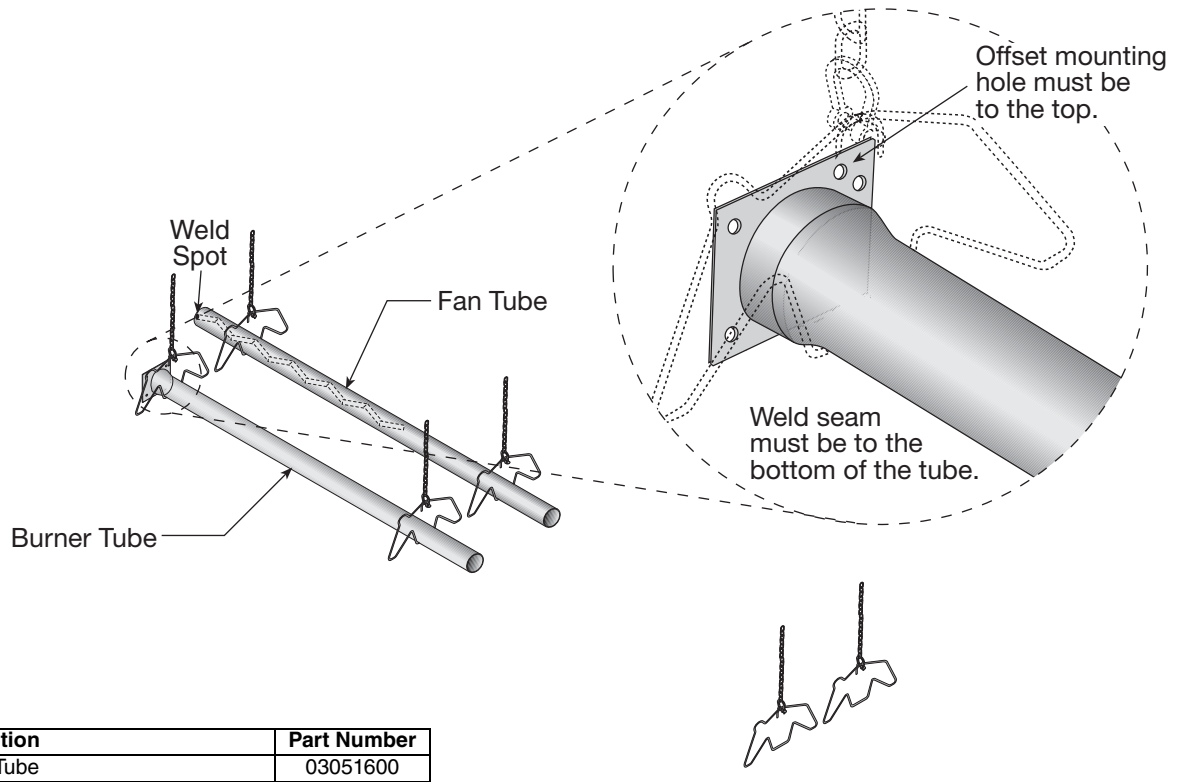
Model	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
Reflector Overlap (approx.)	1780 mm	250 mm	250 mm	580 mm	580 mm	580 mm	690 mm	690 mm

Step 7.2 U-tube Hanger Placement



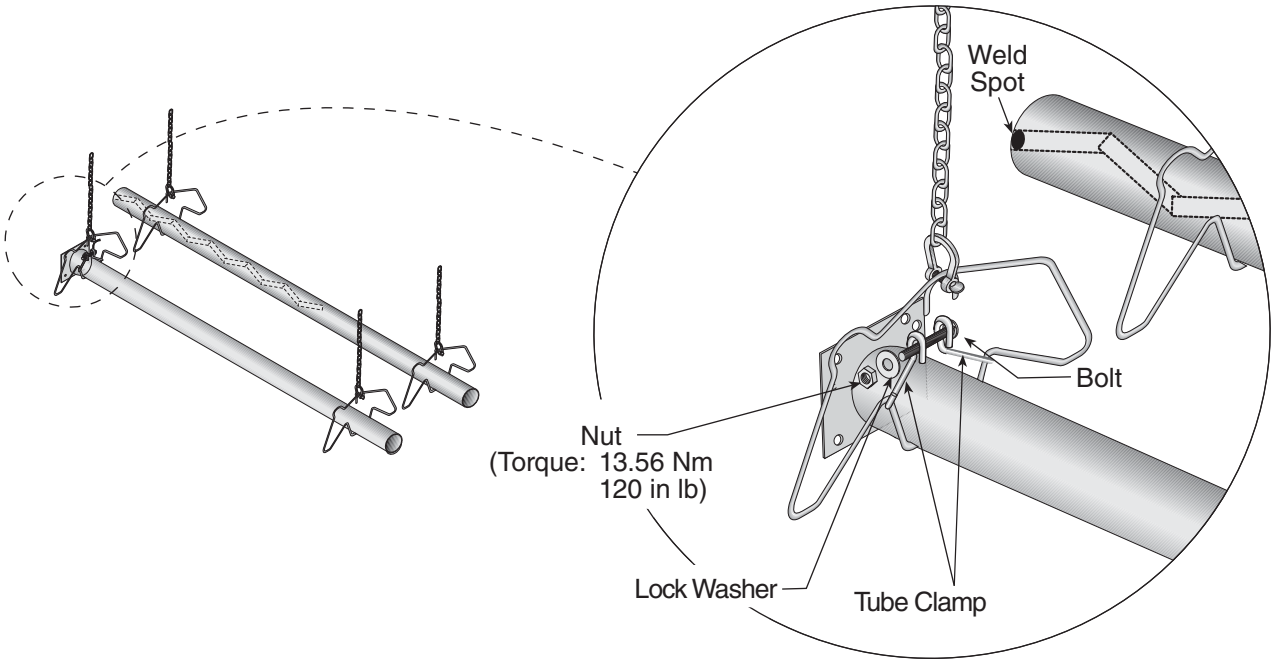
Description	Part Number
Bow Shackle	E0007576
Tube/Reflector Hanger	03090100
Spreader Bar	07260010

Step 7.3 Burner Tube and Fan Tube Installation



Description	Part Number
Burner Tube	03051600
Fan Tube	S5127W

Step 7.3.1 Tube Clamp Package Installation

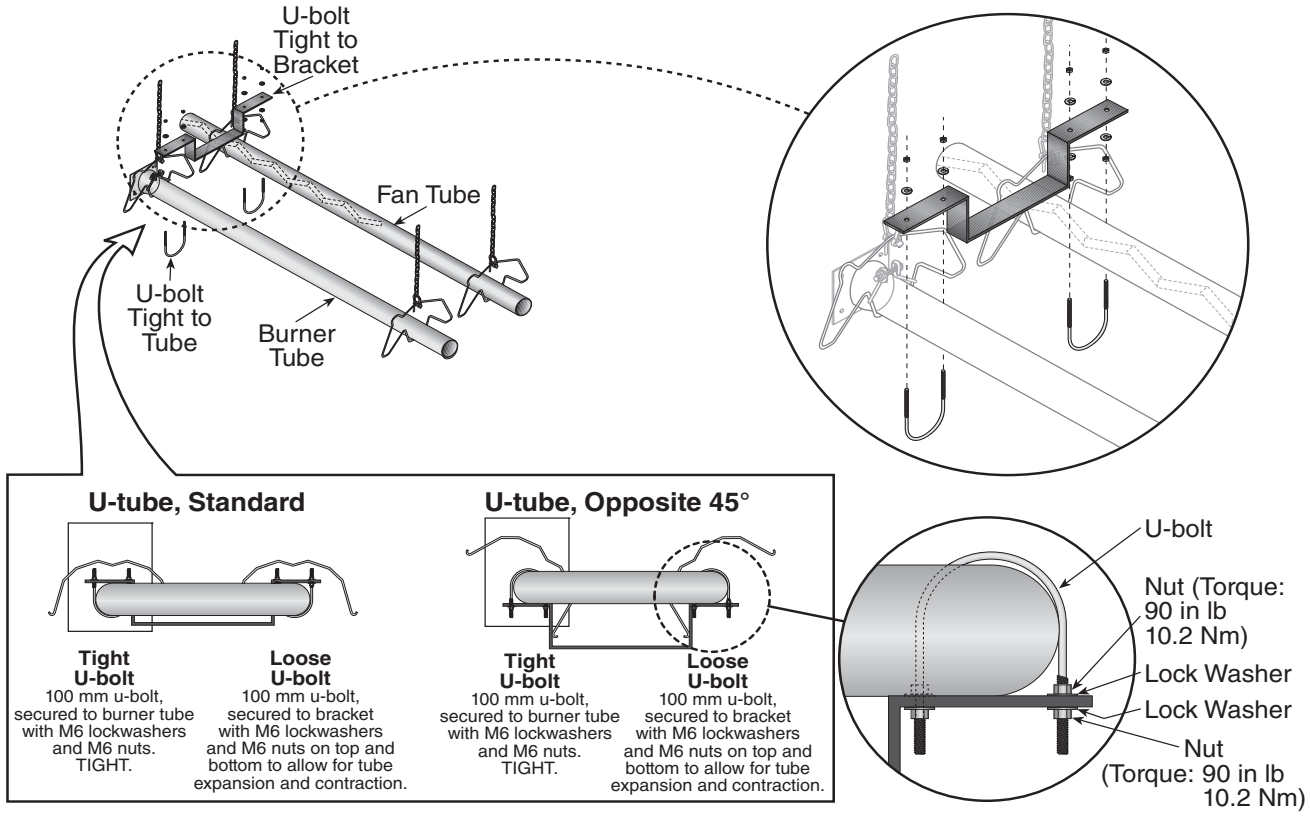


Note: Tube clamp package should be installed 100 mm from burner tube plate.

Other hangers do not need tube clamp packages.

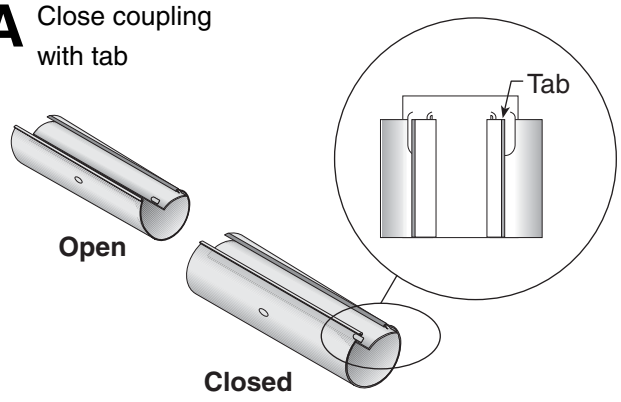
Description	Part Number
Tube Clamp Package	**01318901**
Tube Clamp	01396801
Bolt	97113940
Flat Washer	95211600
Nut	92113900

Step 7.4 U-tube Support Bracket Assembly Installation

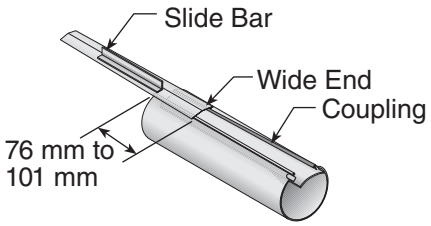


Step 7.5 Coupling and Tube Assembly

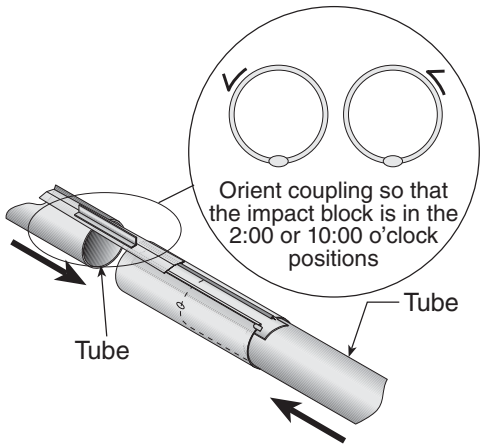
A Close coupling with tab



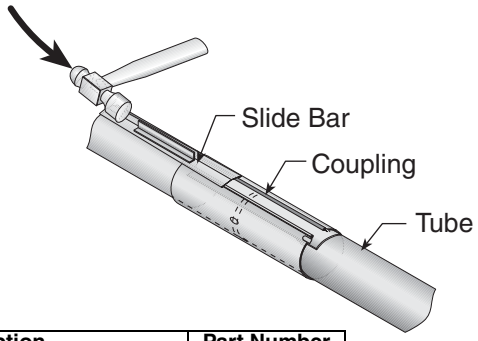
B Start slide bar/coupling lock onto coupling



C Insert tubes into coupling



D Tighten coupling to join tubes

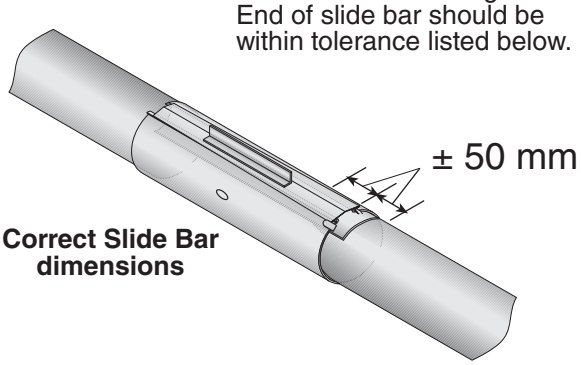


Description	Part Number
Coupling	01329600
Slide Bar/Coupling Lock	01329700
Tube	91409408

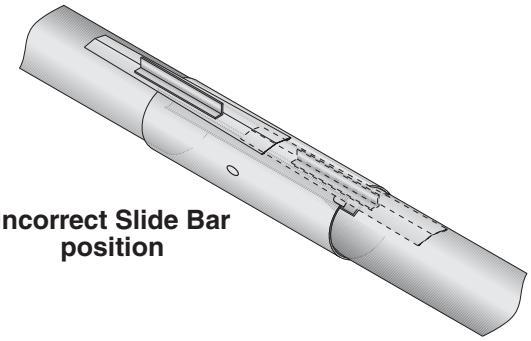
Step 7.5.1 Coupling and Tube Assembly (Continued)

Tighten slide bar as shown below.

Drive slide bar until tight.
End of slide bar should be
within tolerance listed below.



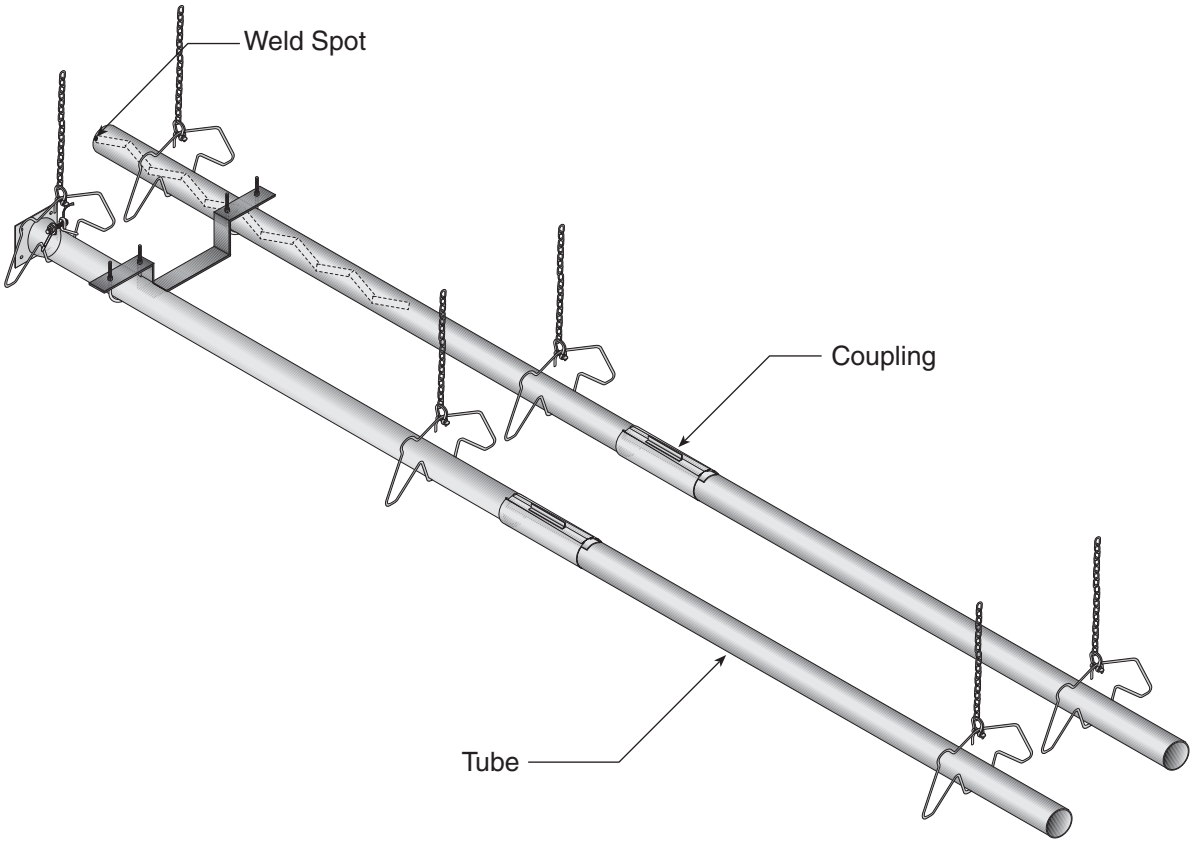
Correct Slide Bar dimensions



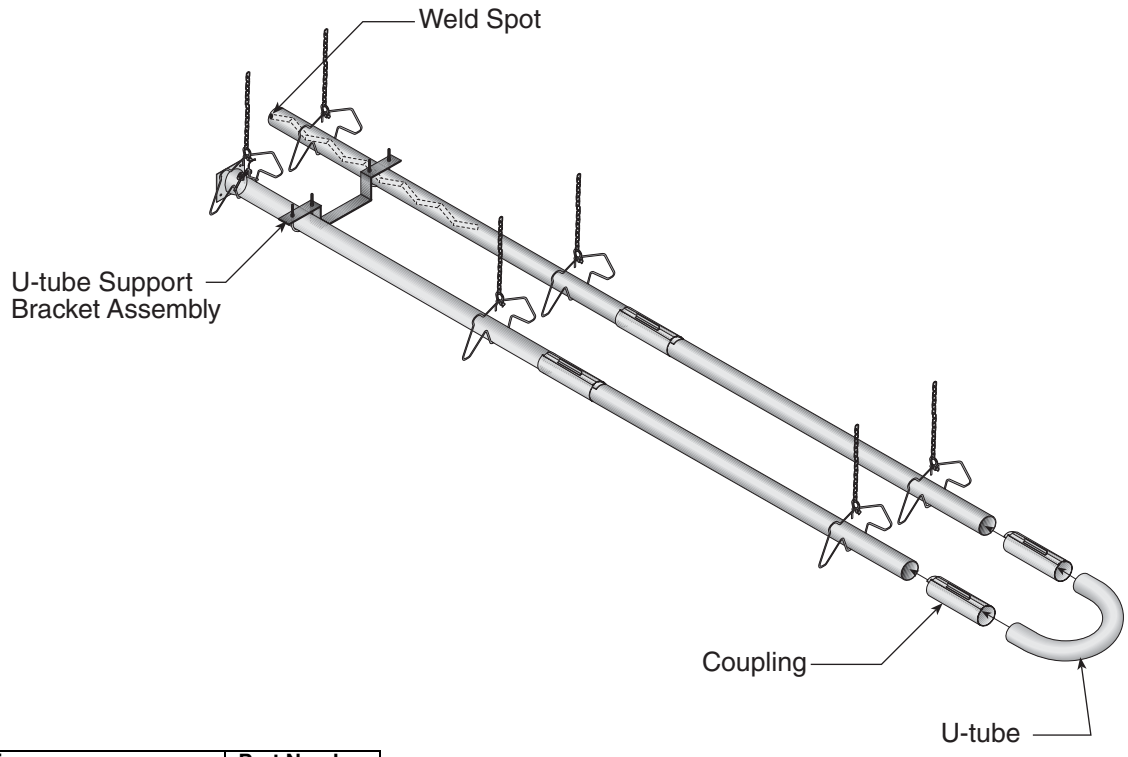
Incorrect Slide Bar position

- **Repeat *Step 7.5* A - D until all tubes are assembled.**

Step 7.6 Tube Installation



Step 7.7 U-tube Installation



Description	Part Number
Coupling	01329600
Slide Bar/Coupling Lock	01329700
U-tube	01335901

Step 7.8 Reflector Installation

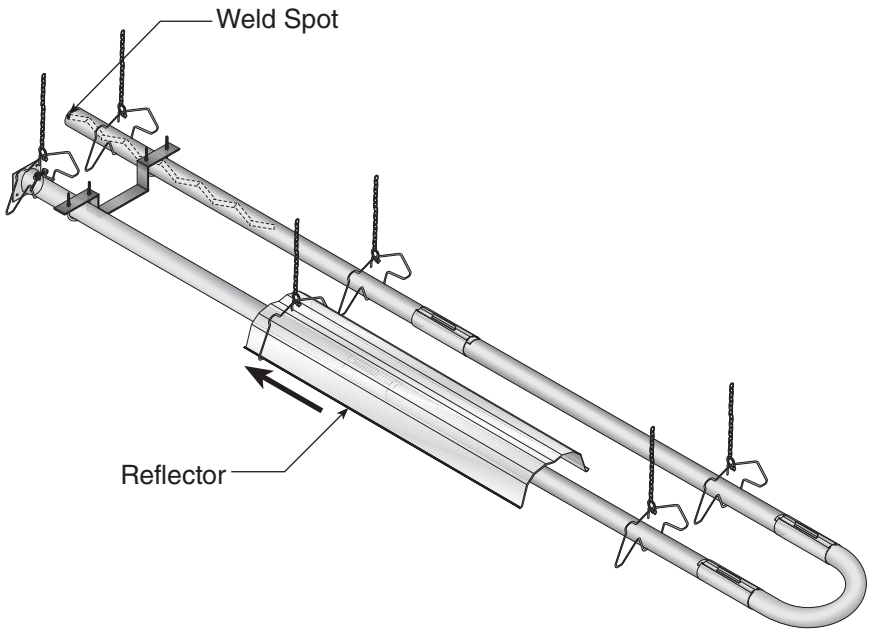
⚠ WARNING

Fire Hazard

Support reflector with reflector hanger and support strap.

Reflector must not touch tube.

Failure to follow these instructions can result in death, injury or property damage.



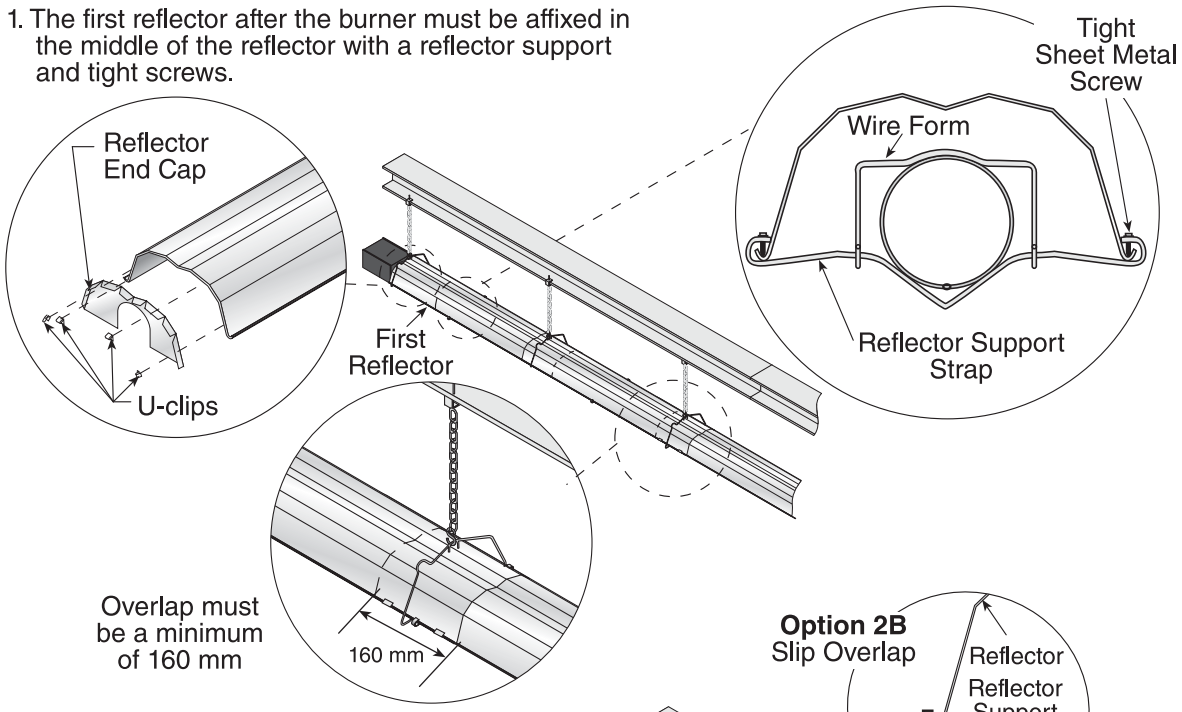
Description	Part Number
Reflector	02750303

Step 7.8.1 Reflector, U-clip and Reflector Support Installation

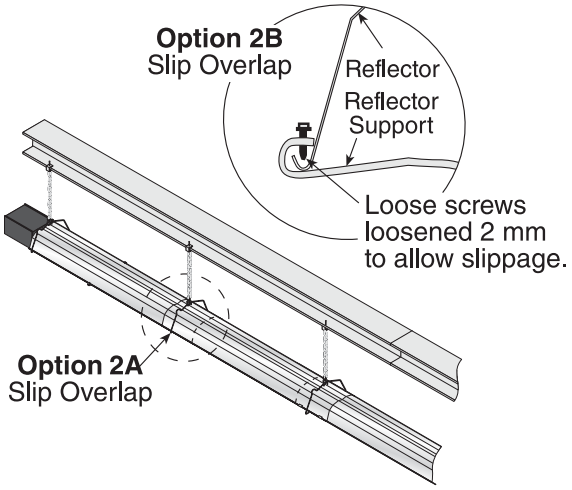
The pictorial drawings of the heater construction in *Section 6* are schematic only and provide a general guideline of where hangers, reflector supports and u-clips are to be installed.

To ensure proper expansion and contraction movement of the reflectors, a combination of u-clips and reflector supports are used. The positioning of reflector supports and u-clips depend on the individual installation. Use either pop rivets or sheet metal screws instead of u-clips when installing end caps and joint pieces in areas where impact and high wind may be a factor. The following rules must be observed:

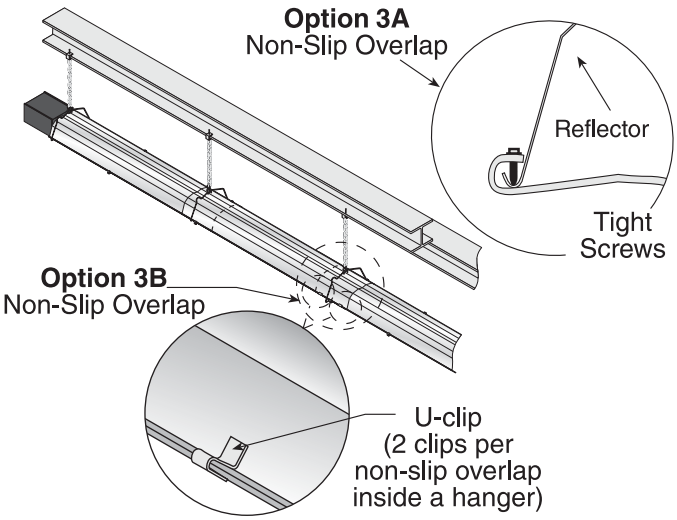
1. The first reflector after the burner must be affixed in the middle of the reflector with a reflector support and tight screws.



2. The overlap at the first and second reflector is a slip overlap. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
   a.) both reflectors lay inside a hanger. (no reflector support needed).
   b.) using a reflector support with loose screws at the reflector overlap.



3. The remaining reflector overlaps require a non-slip overlap connection. To affix the reflectors together in a non-slip overlap either:
   a.) use reflector support and tight screws.
   b.) if both reflectors lay inside a hanger, u-clips or sheet metal screws may be used.
   This section of three reflectors joined together must be affixed to the tube with at least one reflector support with tight screws.



Description	Part Number
Reflector Support Package	**03050010**
Wire Form	91908004
Reflector Support Strap	03050000
Screw #8 x 3/4	94320812
U-clip Package	91107720
Reflector End Cap	027508XX

SECTION 8: MULTIBURNER CONFIGURATION & INSTALLATION

⚠WARNING

Severe Injury Hazard

Secure burner to burner tube with bolts and lockwashers.

Hang heater with materials with a minimum working load of 75 lbs (33 kg).

Failure to follow these instructions can result in death, injury or property damage.

⚠WARNING

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

8.1 Initial Assembly

See Page 13, Section 6 for linear heater assembly instructions.

See Page 25, Section 7 for u-tube heater assembly instructions.

Check layout drawings for location of manifold pipe installation.

Figure 24: Multiburner Damper Flange Installation

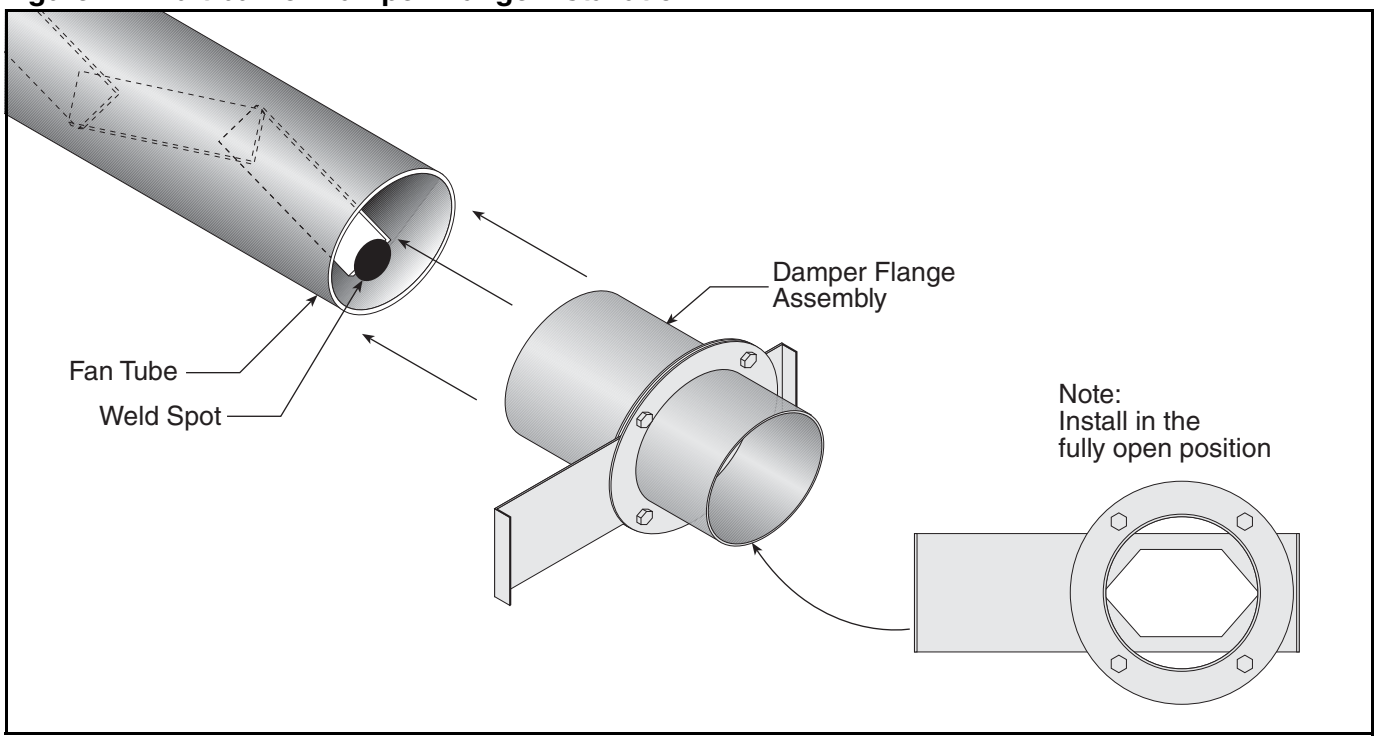
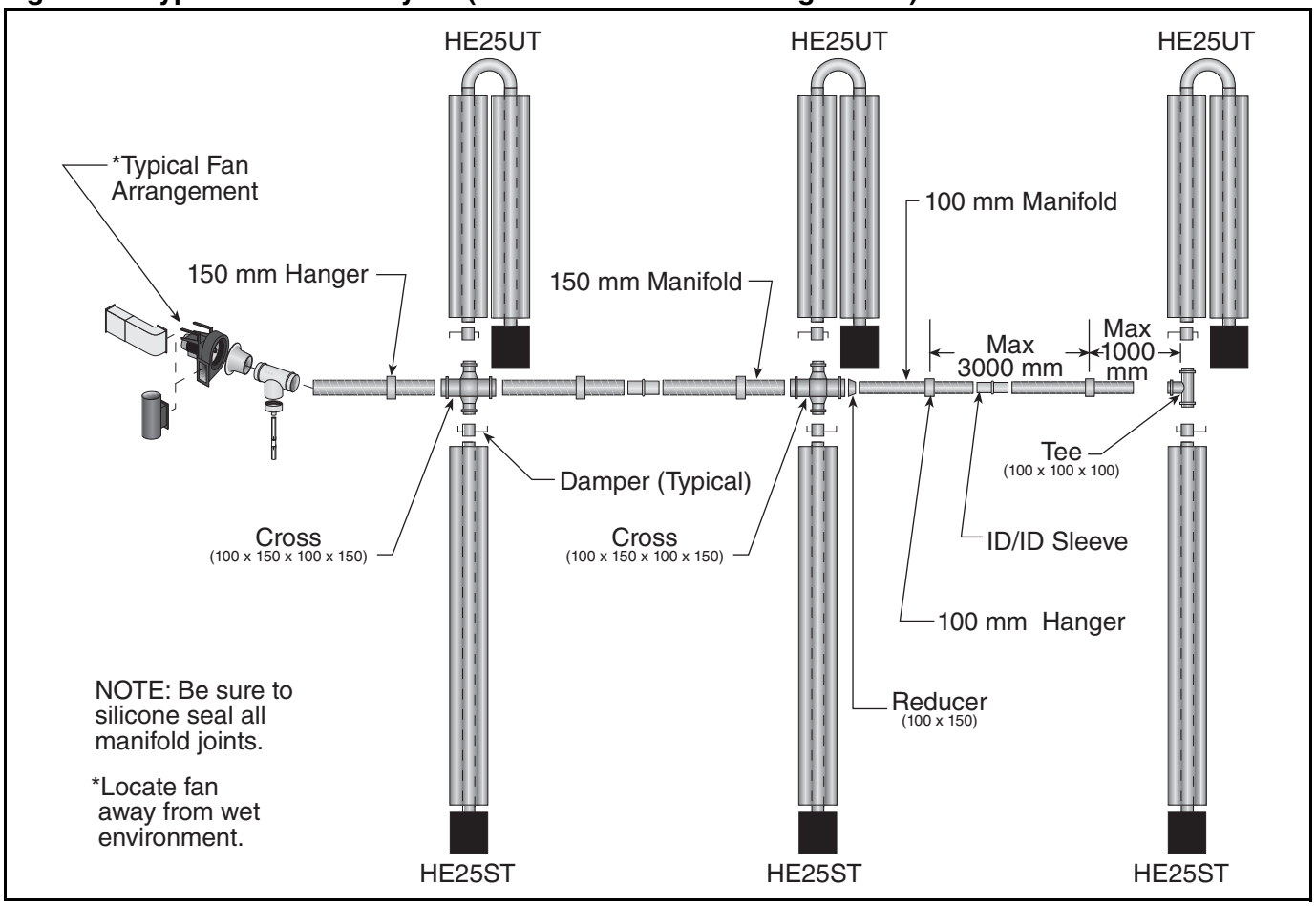


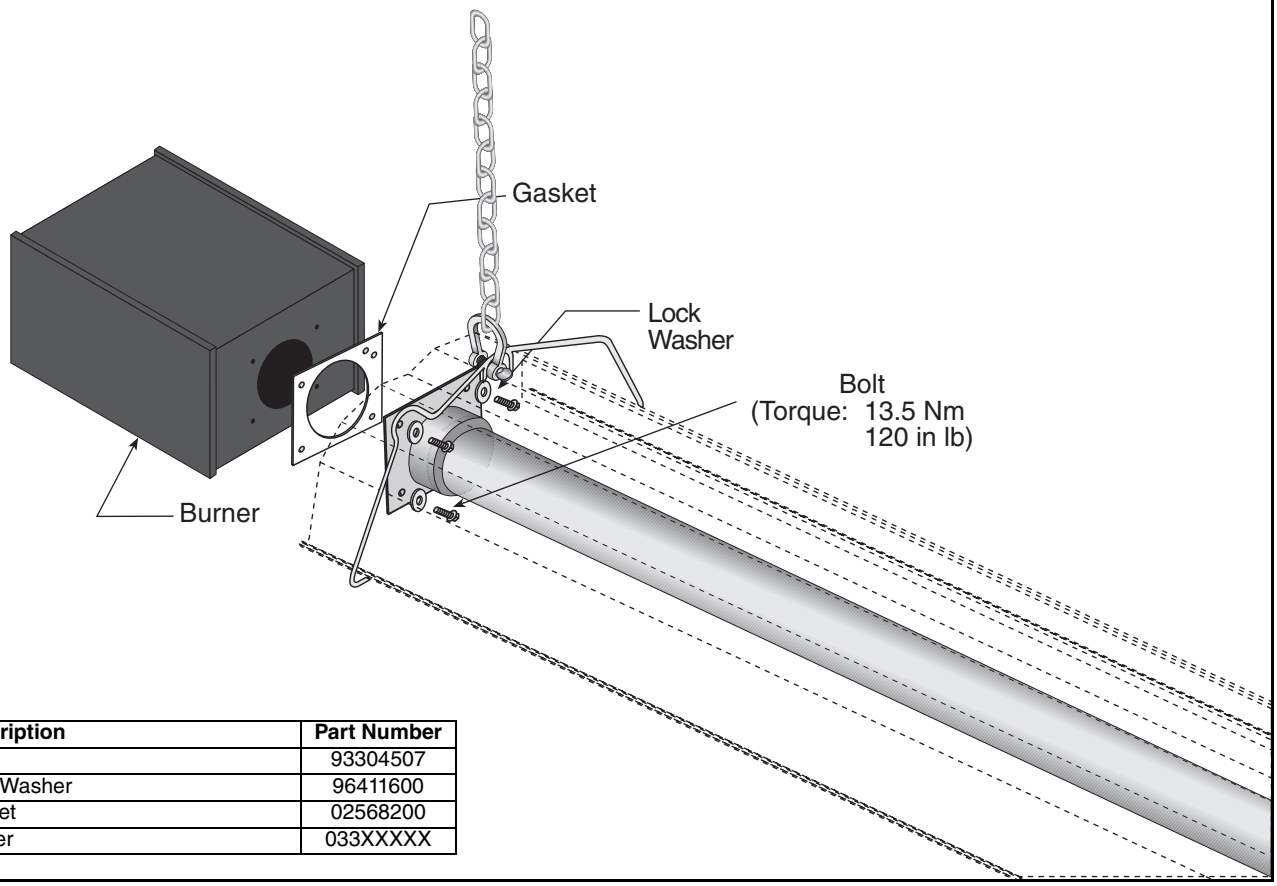
Figure 25: Typical Manifold Layout (Linear and U-Tube Configuration)



SECTION 9: BURNER & FAN INSTALLATION

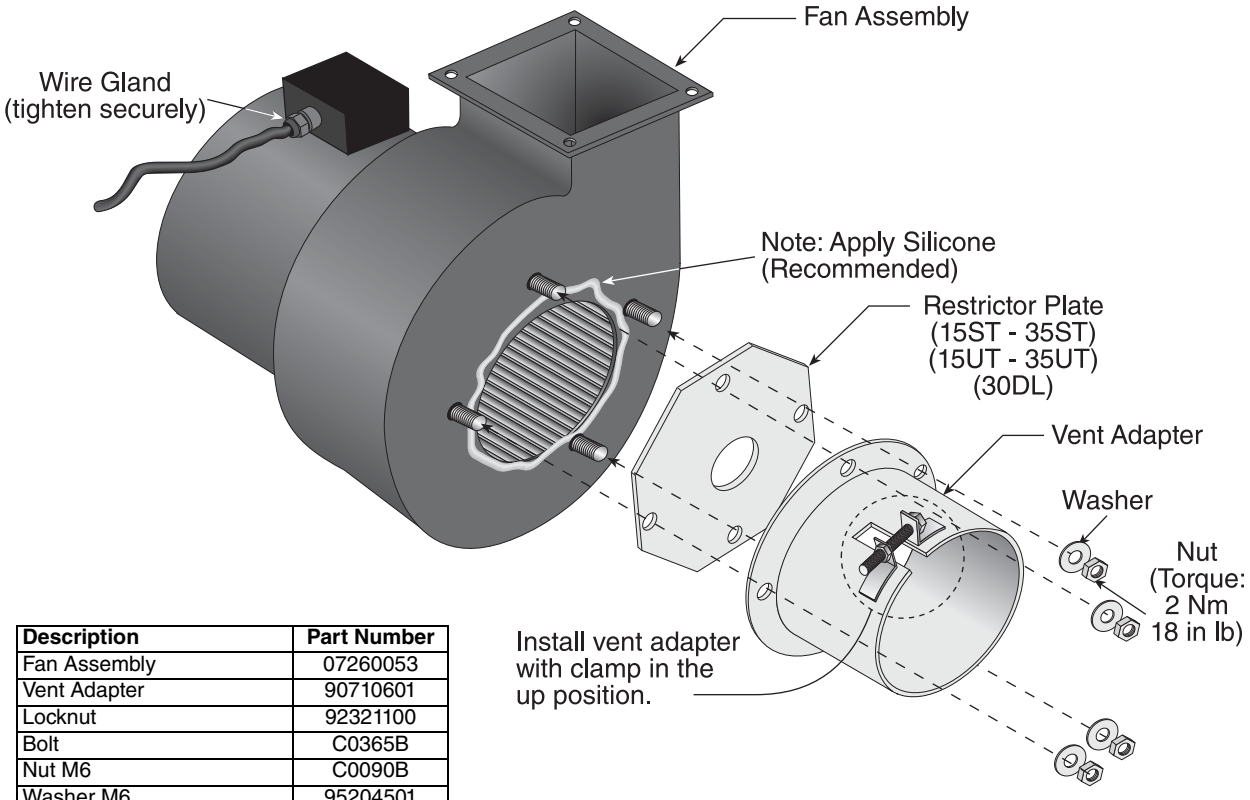
Step 9.1 Burner Installation

NOTE: Tube Clamp Package not shown for clarity.
For details, *see Page 21, Step 6.5*.



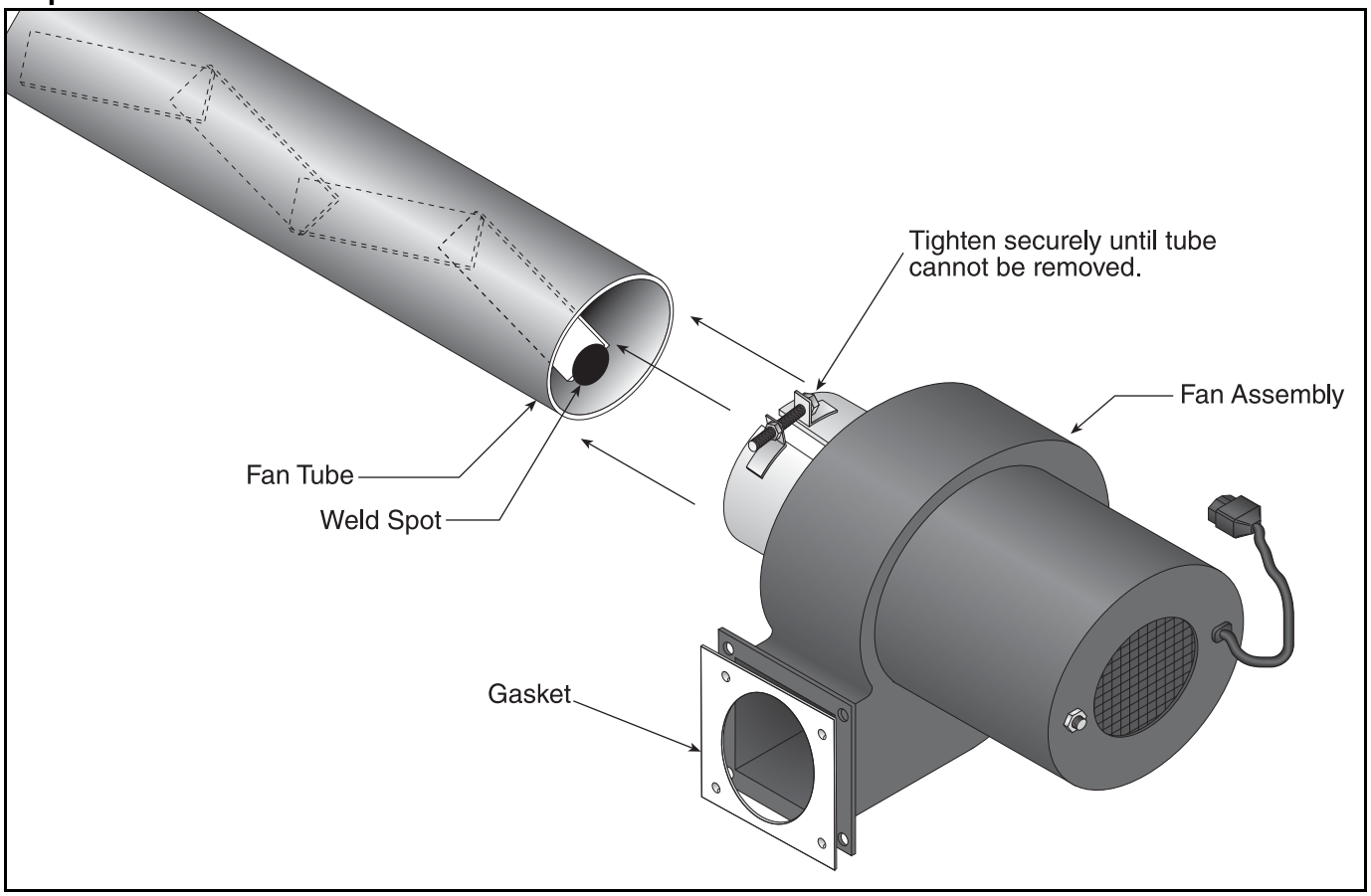
Description	Part Number
Bolt	93304507
Lock Washer	96411600
Gasket	02568200
Burner	033XXXXX

Step 9.2 IP55 Fan Assembly

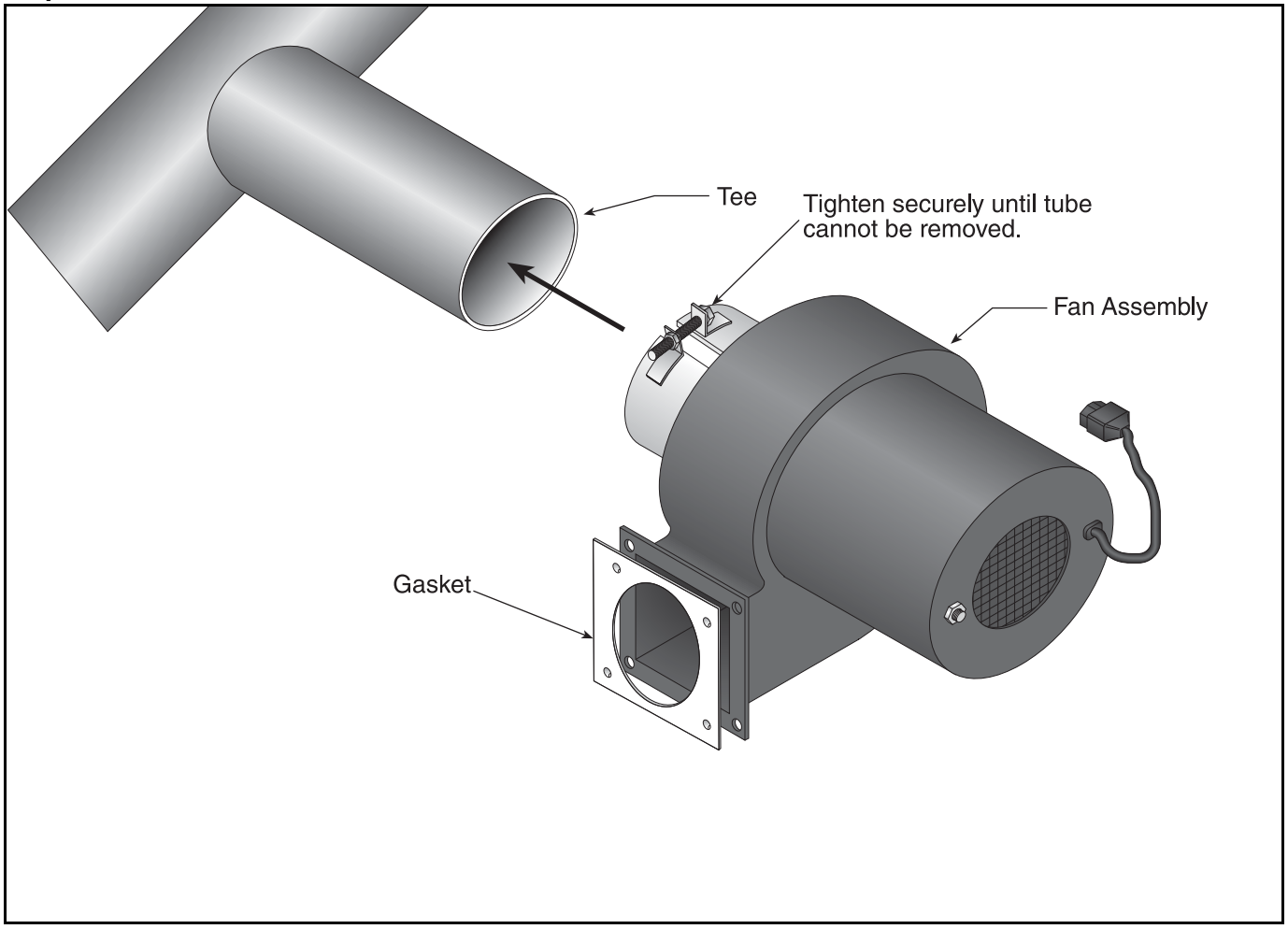


Description	Part Number
Fan Assembly	07260053
Vent Adapter	90710601
Locknut	92321100
Bolt	C0365B
Nut M6	C0090B
Washer M6	95204501
Washer Flat	95310800
Outlet Gasket	90710704
Inlet Gasket	90710203
Restrictor Plate	033601XX

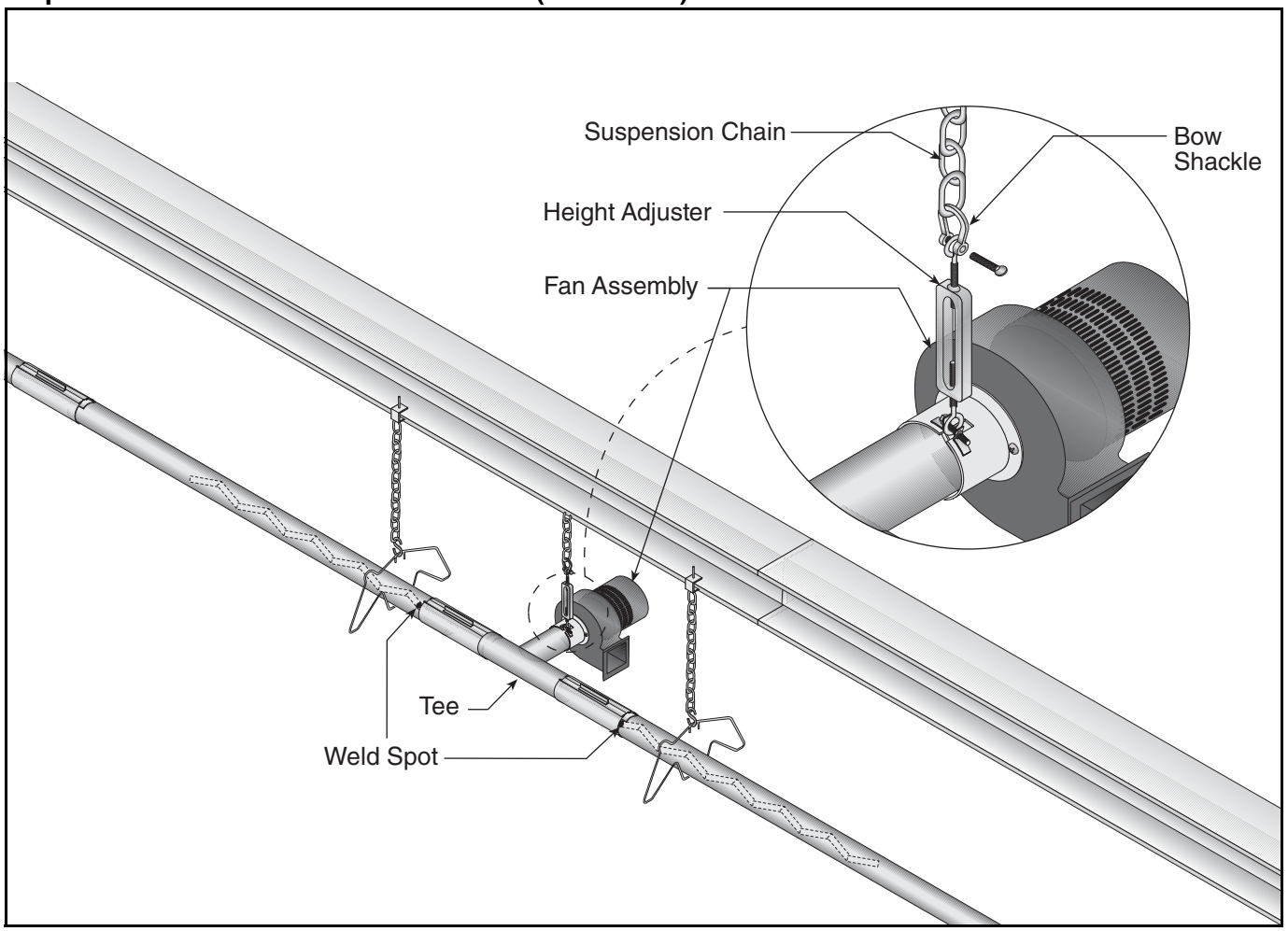
Step 9.3 Linear & U-tube Fan Installation



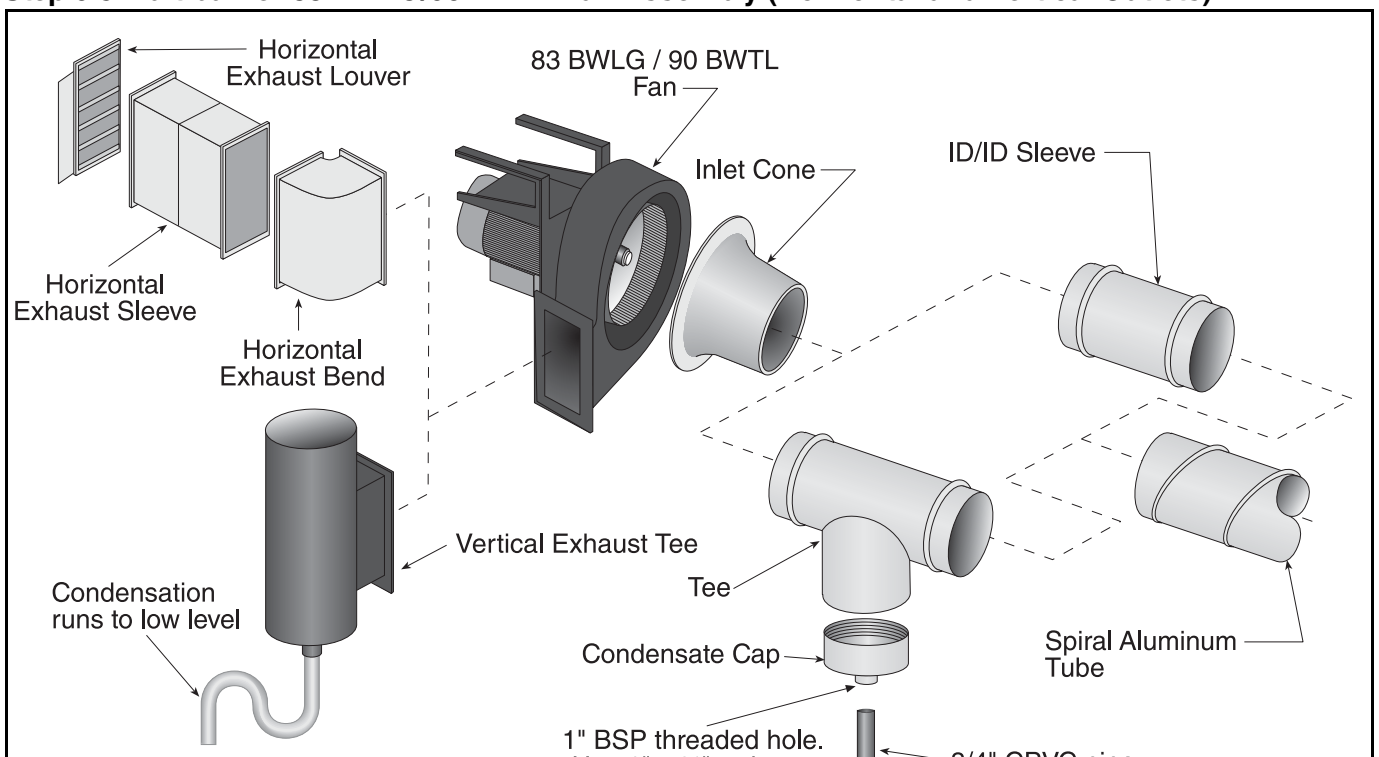
Step 9.4 Double Linear Fan Installation



Step 9.4.1 Double Linear Fan Installation (Continued)

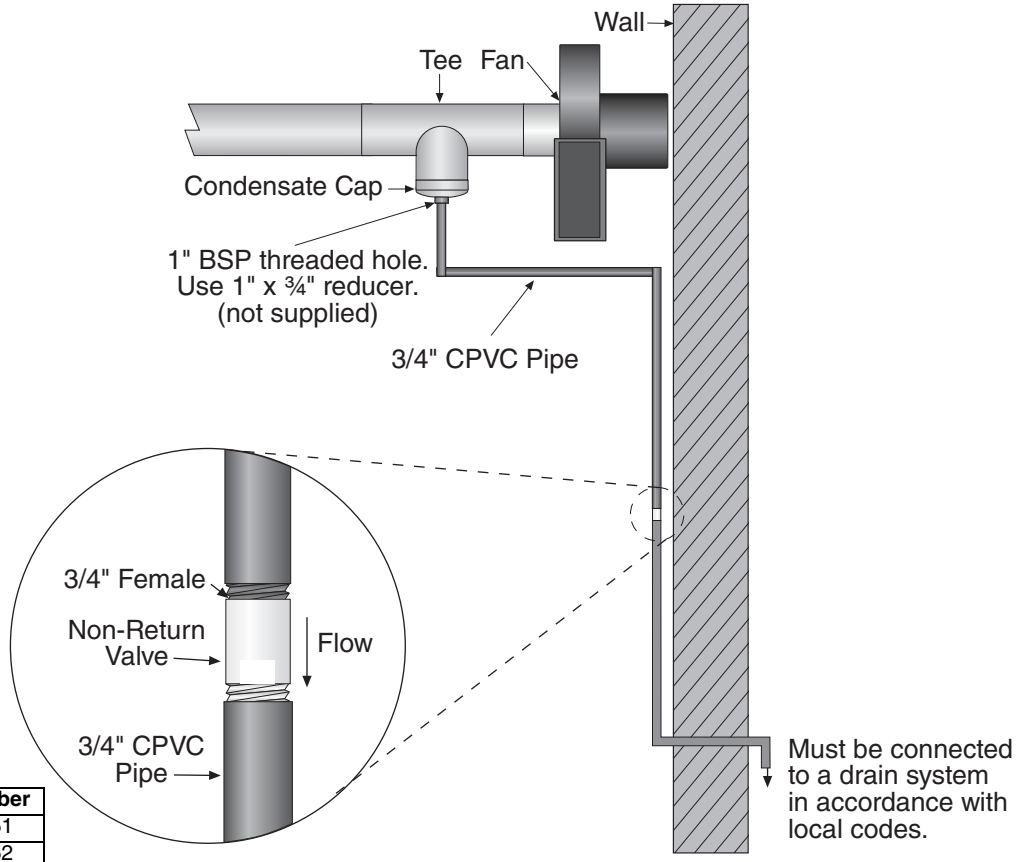


Step 9.5 Multiburner 83 BWLG/90 BWTL Fan Assembly (Horizontal and Vertical Outlets)



Description	Part Number
Vertical Exhaust Tee	C1324B
Horizontal Exhaust Bend	C1325B
Horizontal Exhaust Sleeve	C1326B
Horizontal Exhaust Louver	S5055F
Condensate Cap 4"	02718851
Condensate Cap 6"	02718852
Non-Return Valve	90201200

Step 9.6 Condensate Drain Assembly



Description	Part Number
Condensate Cap 4"	02718851
Condensate Cap 6"	02718852
Non-Return Valve	90201200

SECTION 10: OPTIONAL HEATER ACCESSORIES

⚠WARNING

Cut/Pinch Hazard

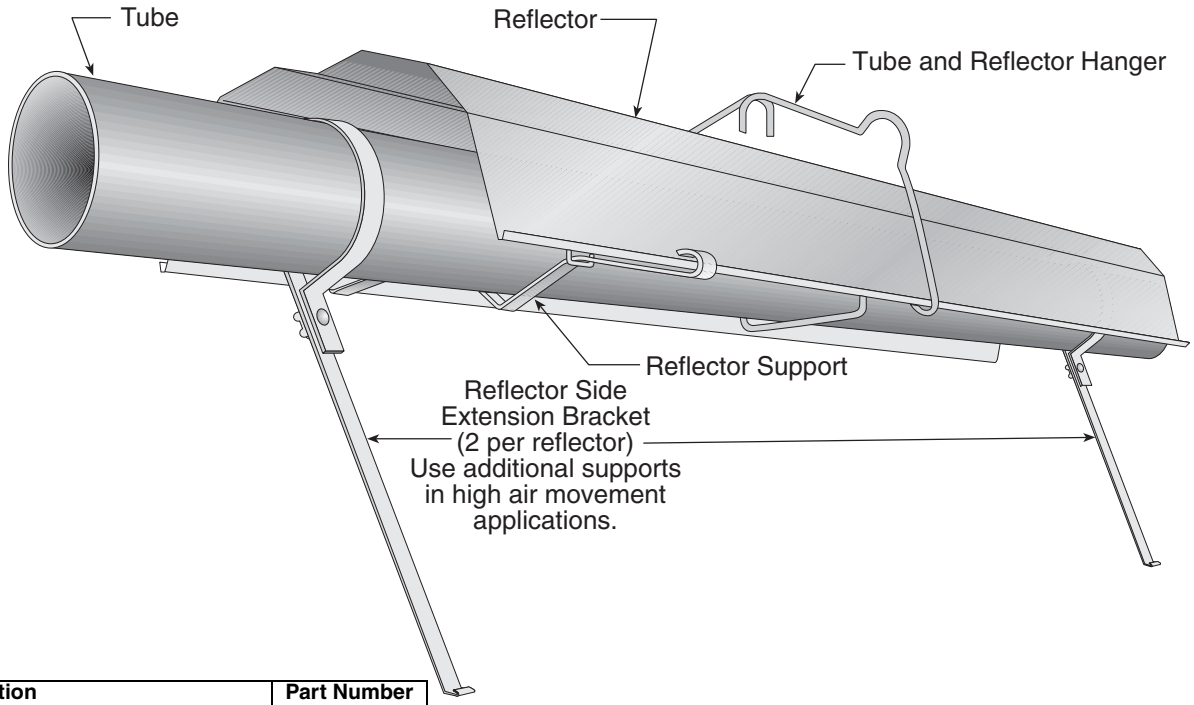
Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

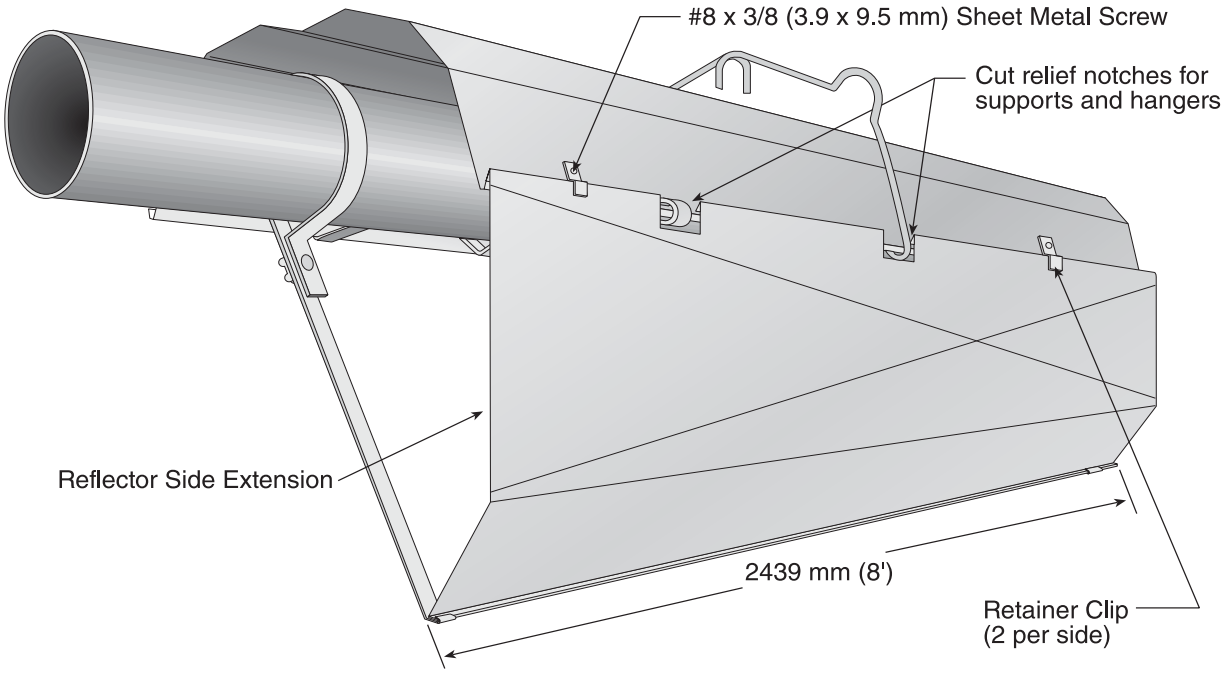
10.1 Reflector Side Extension Installation

Step 10.1.1 Bracket Installation



Description	Part Number
Reflector Side Extension Package	**S7377K**
Reflector Side Extension	01368000
Retainer Clips	02751200
Reflector Side Extension Bracket	01329910

Step 10.1.2 Side Reflector Installation



10.2 U-Tube Cover Installation

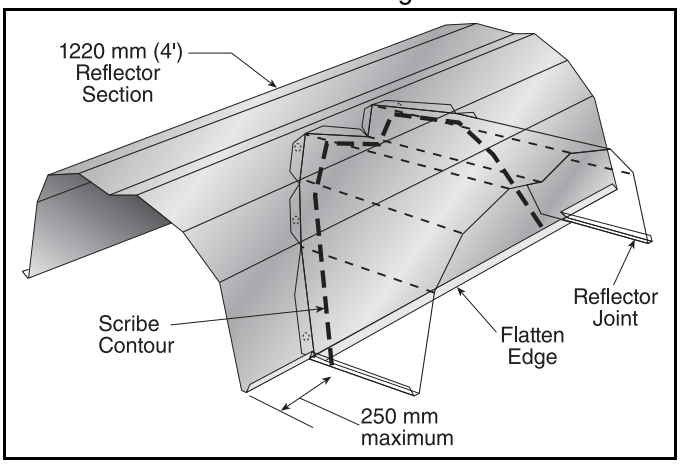
The package contains two reflector joint pieces (P/N 02750901), one 2439 mm (8') reflector and 18 x #8 sheet metal screws. Install the u-tube cover using the following procedure.

Step 10.2.1

Cut the 2439 mm (8') reflector in half to be used on both sides to cover the u-tube.

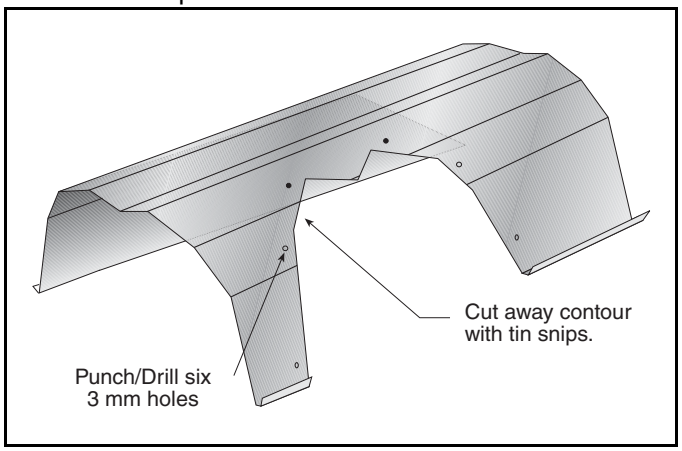
Step 10.2.2

Flatten 1220 mm (4') reflector edge where joint piece matches. Put a mark on the 1220 mm (4') reflector, directly over the tube center. Center the accessory joint piece on the mark and scribe its contour on the reflector. Scribe the location of the mounting holes.



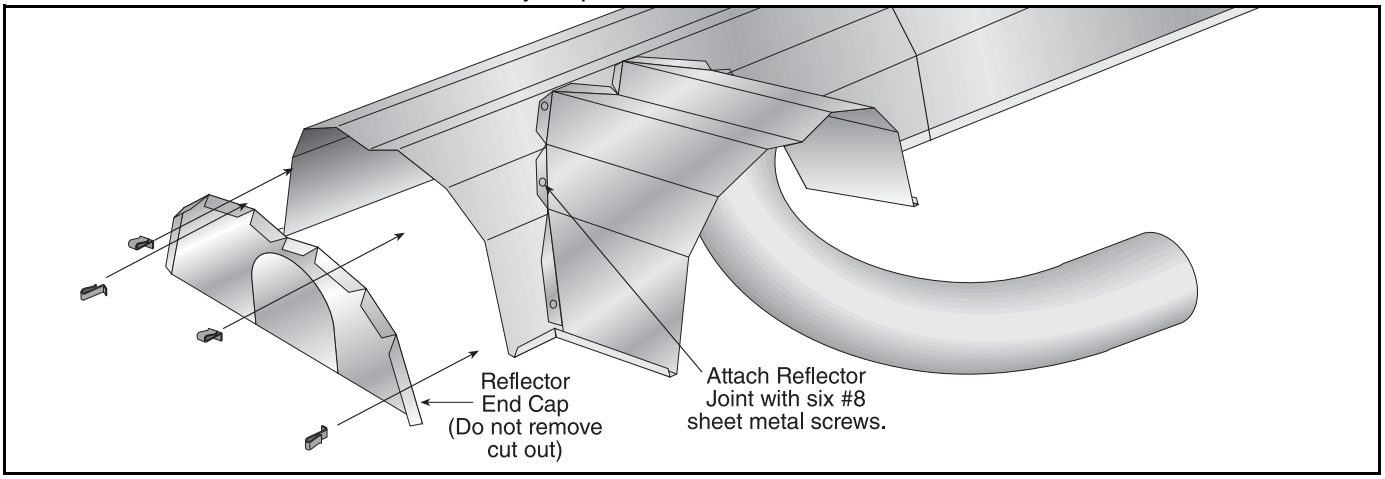
Step 10.2.3

Cut away the reflector to clear the tube, leaving about 25 mm of material inside the scribed contour to attach the accessory joint. Drill or punch six 3 mm diameter holes in reflector in the positions shown below.



Step 10.2.4

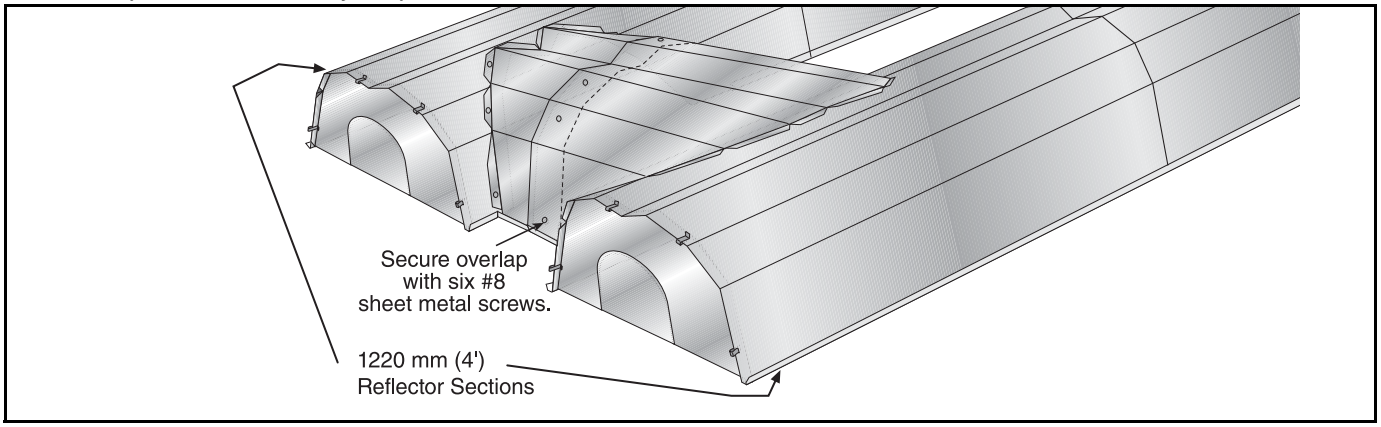
Use six #8 sheet metal screws to attach the joint piece.



Repeat *Steps 10.2.1 through 10.2.4* to attach the reflector joint piece on the other reflector.

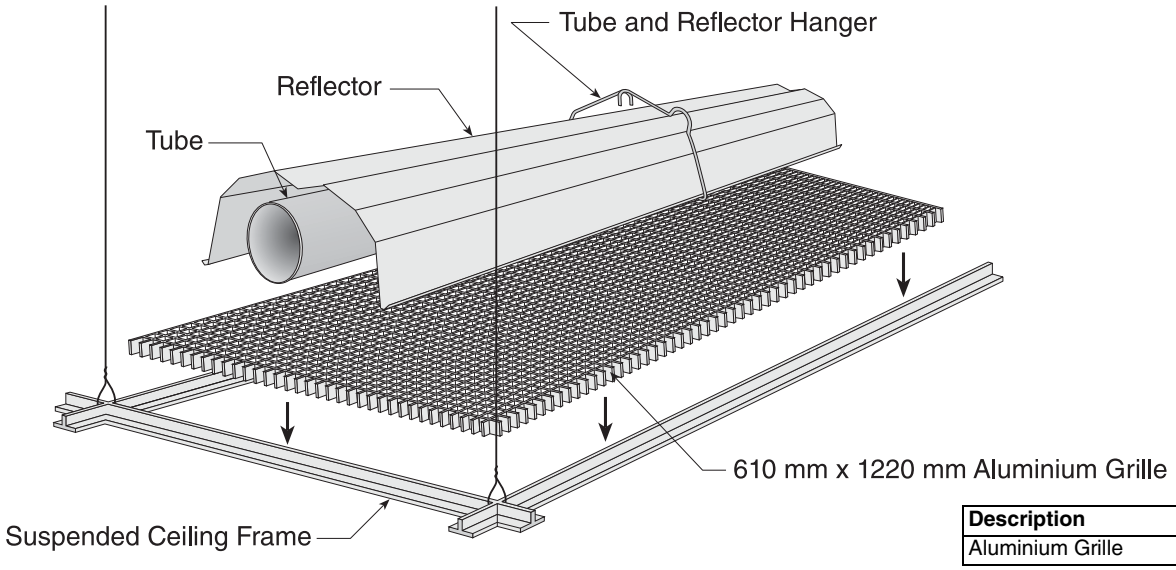
Step 10.2.5

The overlap of both reflector joint pieces is attached with six #8 sheet metal screws.



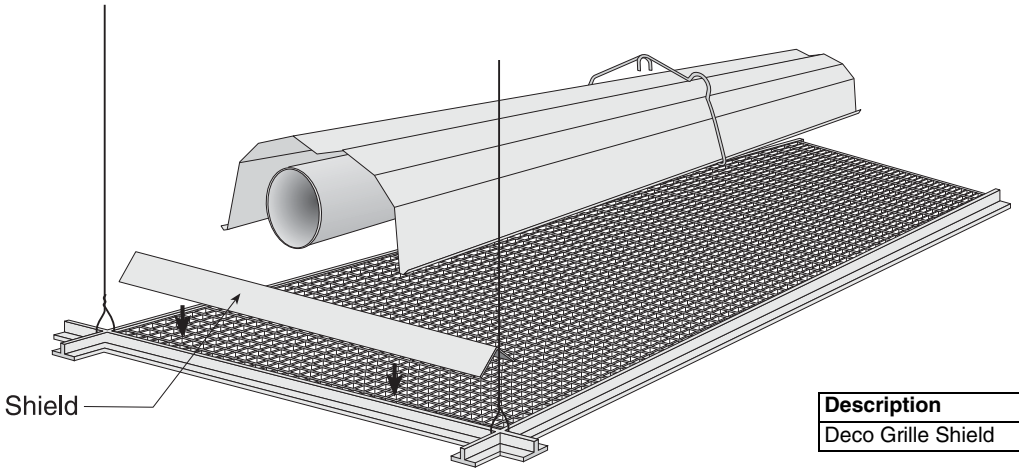
10.3 Decorative Grille Installation

Step 10.3.1 Grille Installation



Description	Part Number
Aluminium Grille	91407000

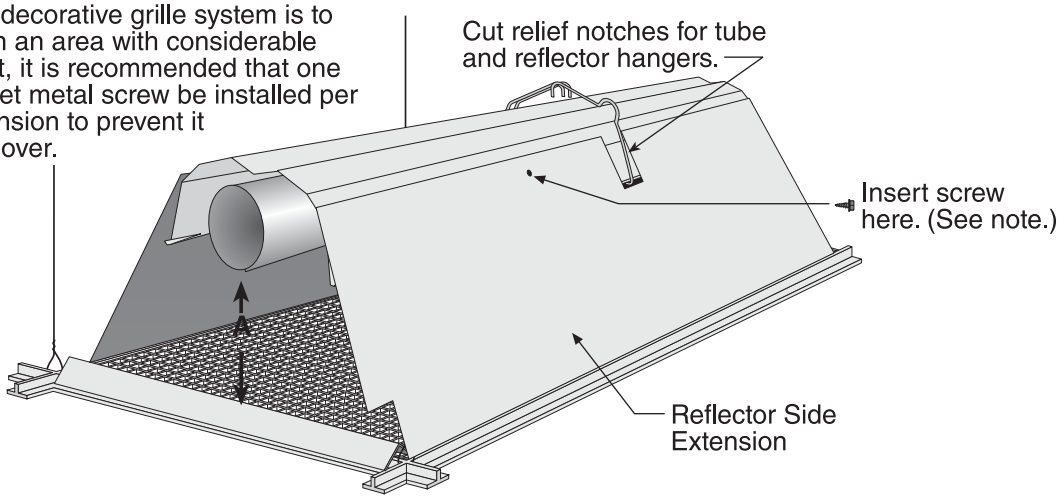
Step 10.3.2 Frame Shield Installation



Description	Part Number
Deco Grille Shield	01365900

Step 10.3.3 Reflector Side Extension Installation for Decorative Grilles

NOTE: If the decorative grille system is to be installed in an area with considerable air movement, it is recommended that one #8 x 3/8" sheet metal screw be installed per reflector extension to prevent it from blowing over.

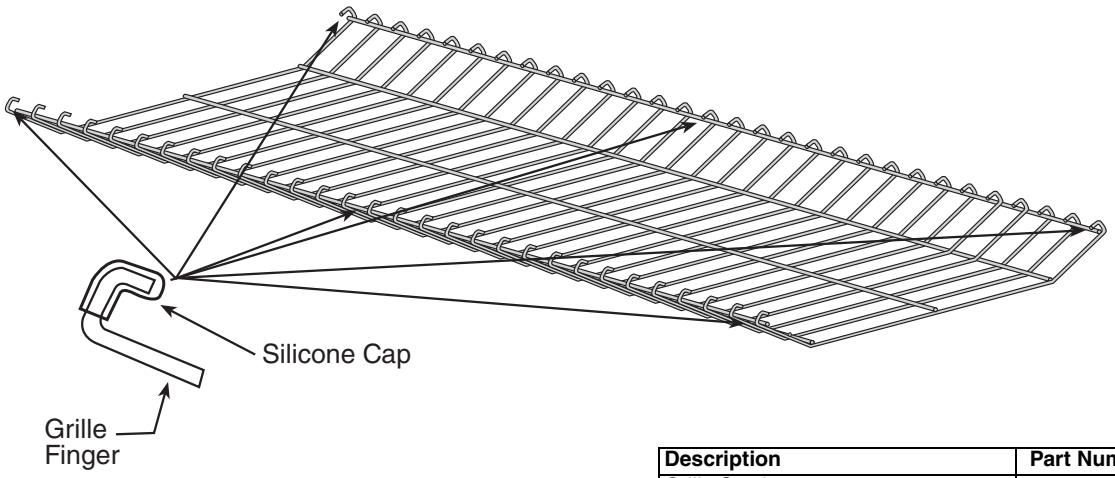


Description	Part Number
Reflector Side Extension	01370412

Distance "A"		Extension	
Minimum	Maximum	Part No.	Width
40 mm	150 mm	01370408	200 mm
150 mm	260 mm	01370412	300 mm
260 mm	370 mm	01370416	400 mm

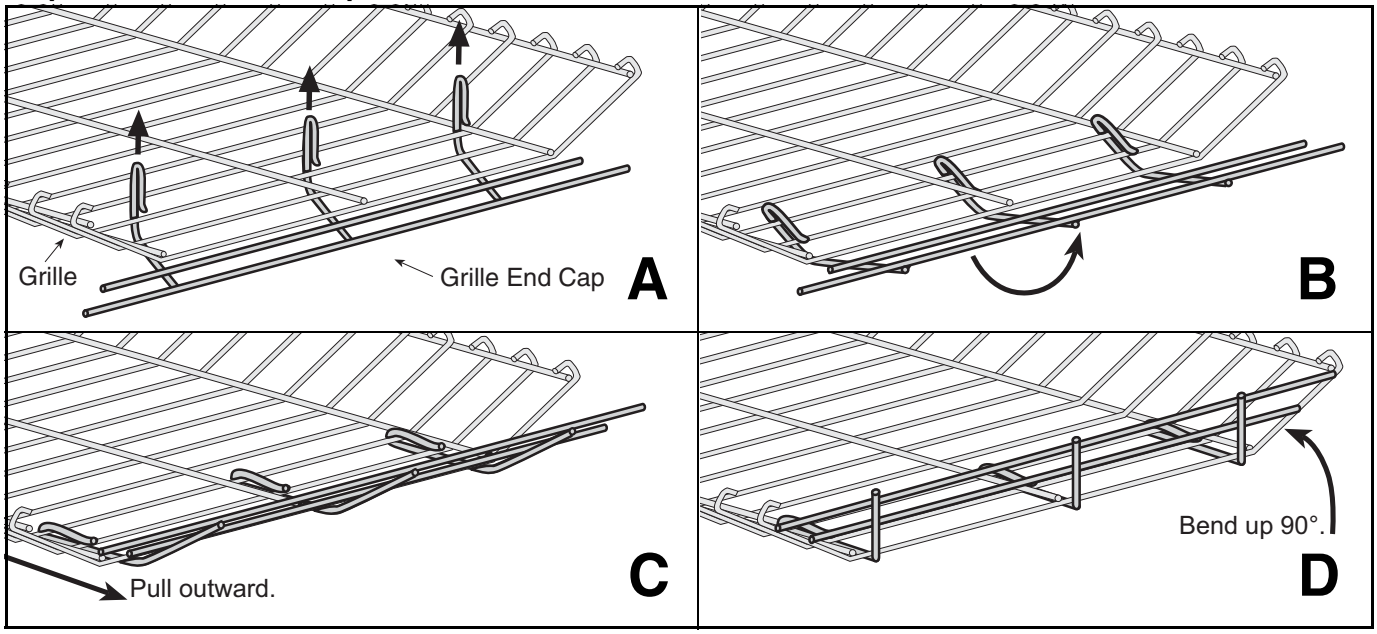
10.4 Protective Grille Installation

Step 10.4.1 Silicone Cap Installation

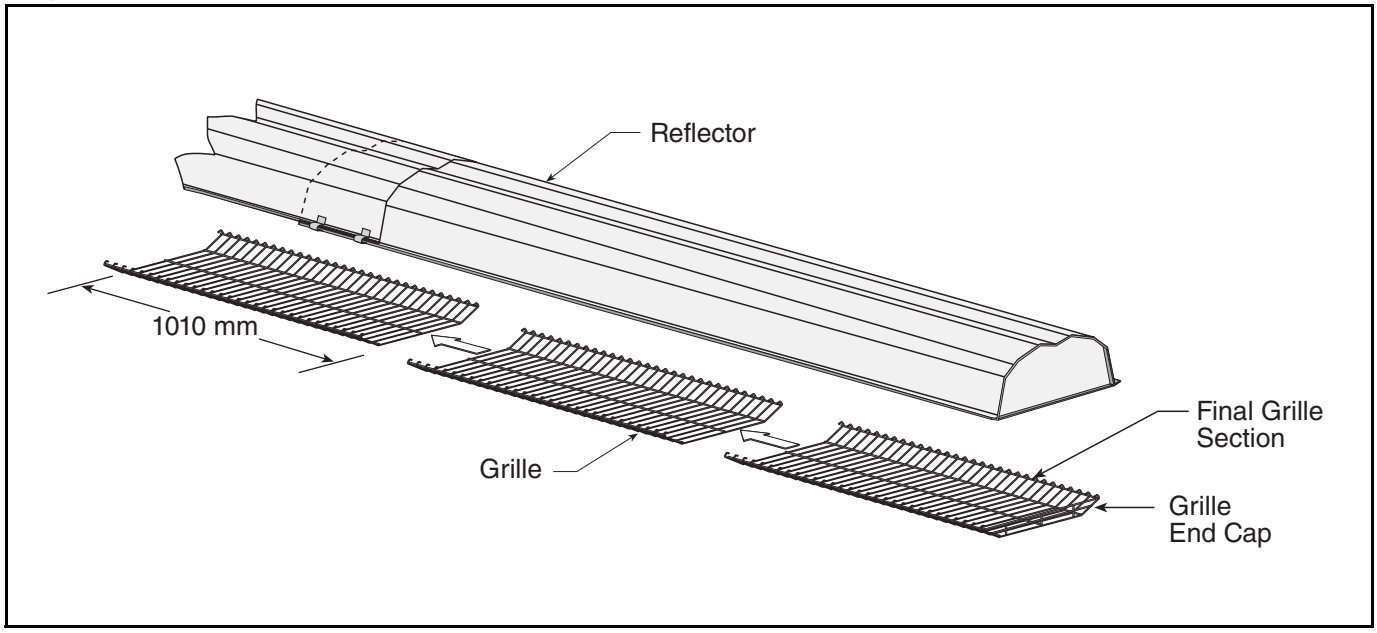


Description	Part Number
Grille Section	08050001
Grille End Cap	08050002
Silicone Cap	91915951-6P

Step 10.4.2 Grille End Cap Installation

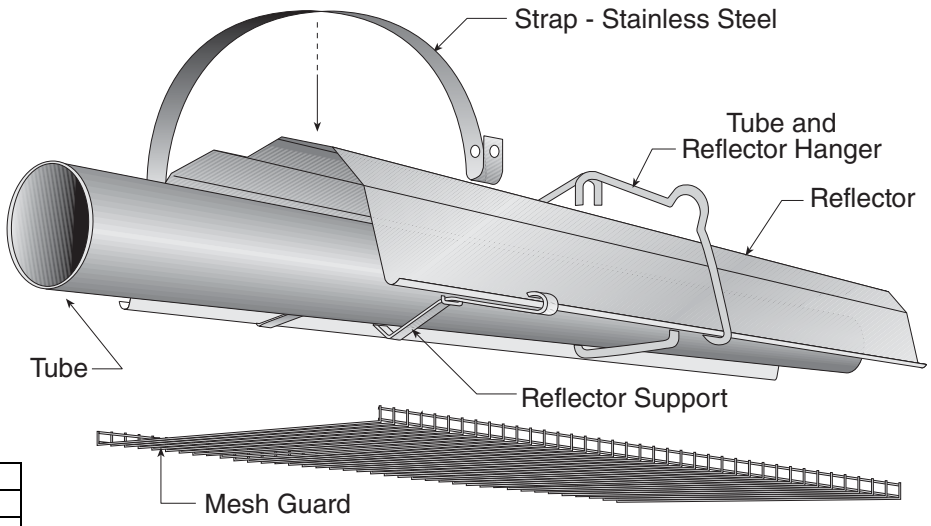


Step 10.4.3 Grille Installation



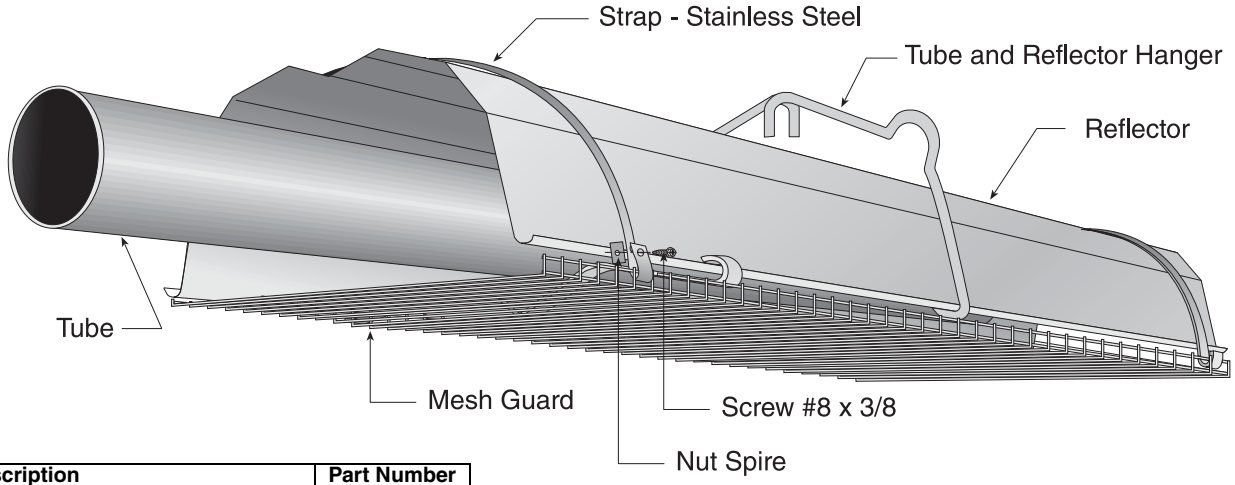
10.5 Sports Hall Guard Installation

Step 10.5.1 Grille Installation



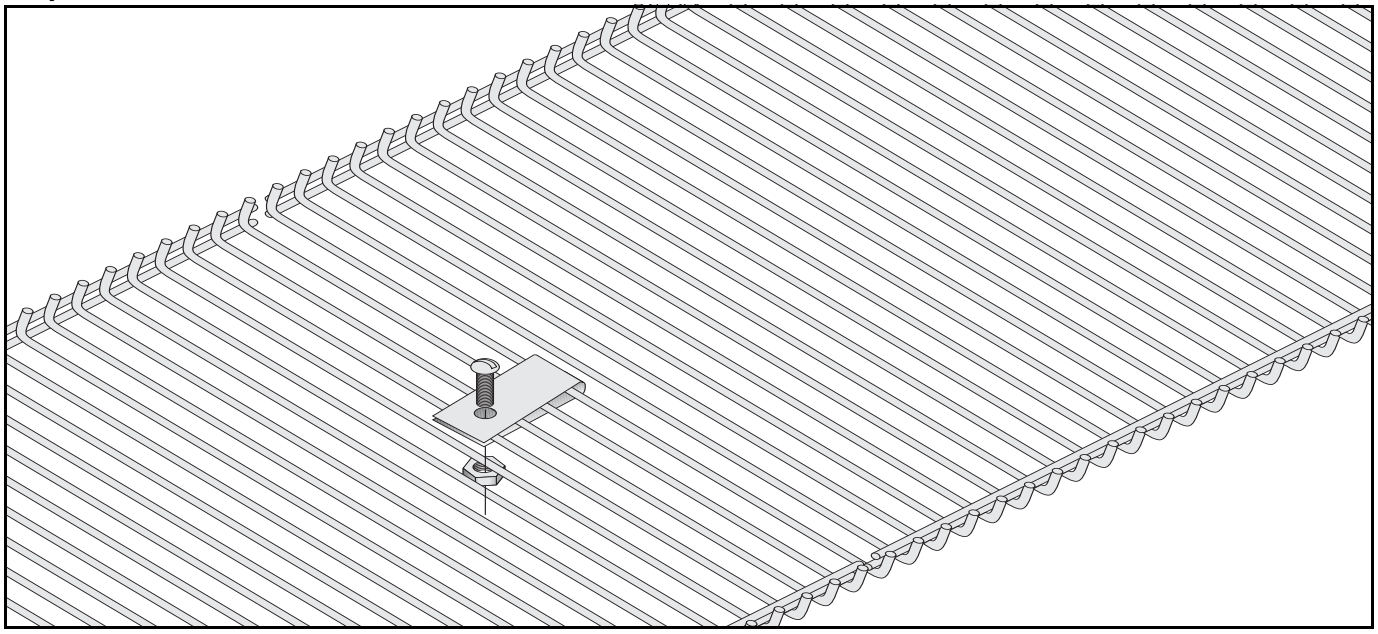
Description	Part Number
Mesh Guard 2438 mm	E0009855
Mesh Guard 1524 mm	C2329B
Strap Stainless Steel	S5218W

Step 10.5.2 Fastener Installation



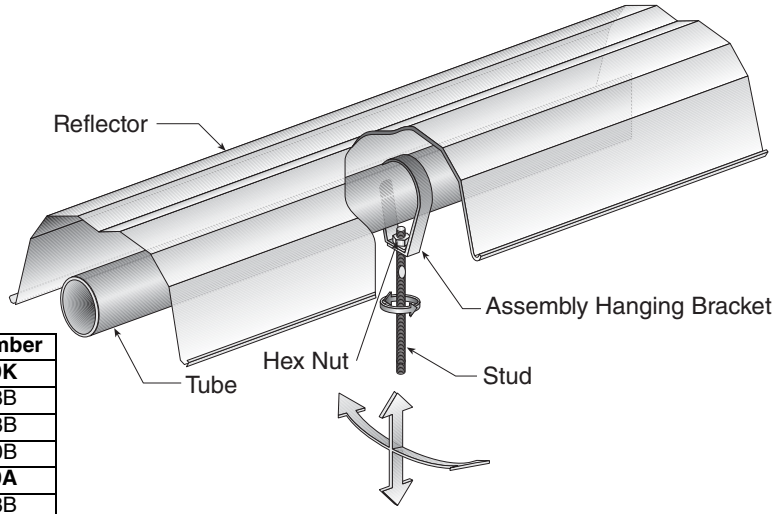
Description	Part Number
Nut Spire	C1088B
Screw #8 x 3/8	C1089B

Step 10.5.3 Mesh Guard Connection



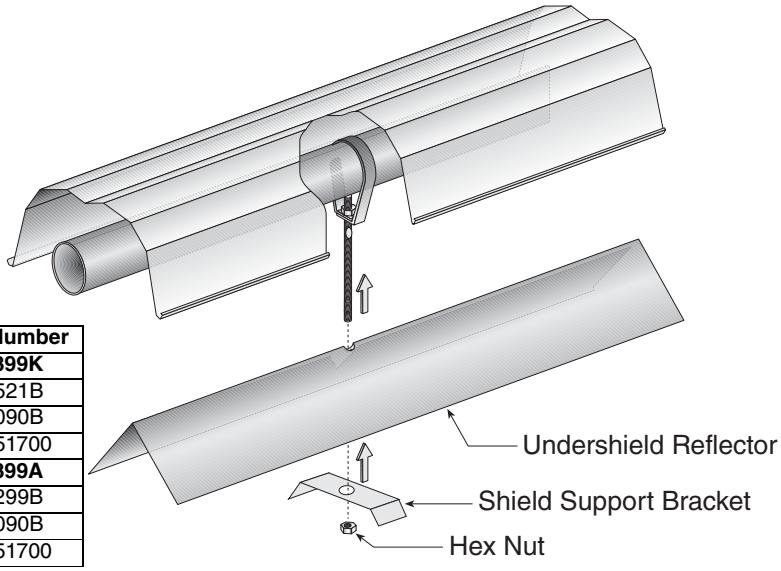
10.6 Undershield Installation

10.6.1 Hanger Installation



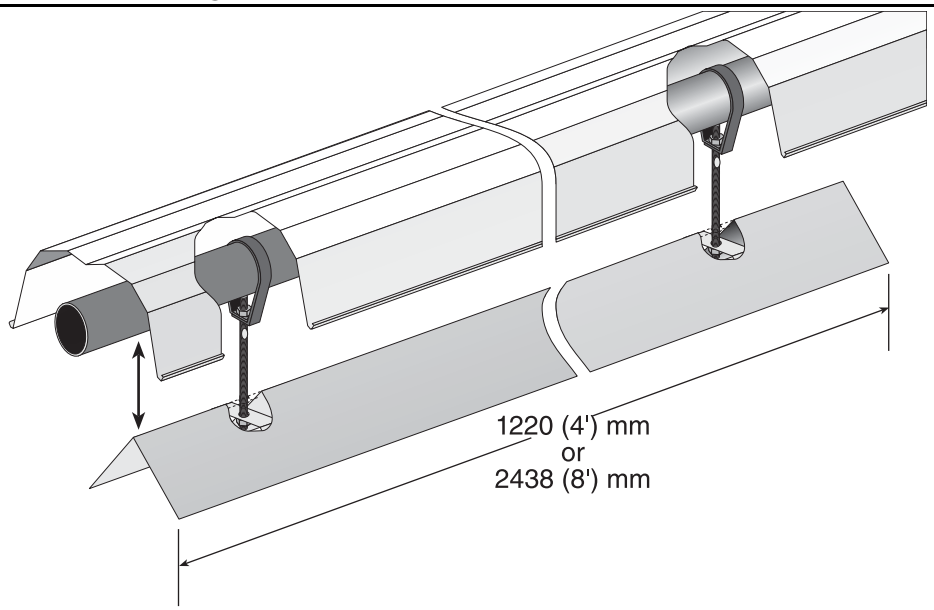
Description	Part Number
Undershield Reflector Package 1220 mm (4')	**S7399K**
Assembly Hanging Bracket	C0318B
Stud M6 x 90	C0693B
Nut M6	C0090B
Undershield Reflector Package 2438 mm (8')	**S7399A**
Assembly Hanging Bracket	C0318B
Stud M6 x 90	C0693B
Nut M6	C0090B

10.6.2 Undershield Installation



Description	Part Number
Undershield Reflector Package 1220 mm (4')	**S7399K**
Undershield Reflector 1220 mm (4')	C0521B
Nut M6	C0090B
Shield Support Bracket	02751700
Undershield Reflector Package 2438 mm (8')	**S7399A**
Undershield Reflector 2438 mm (8')	R1299B
Nut M6	C0090B
Shield Support Bracket	02751700

10.6.3 Adjust Undershield Height



10.7 Wall Mounting

Install wall mounting brackets at the height shown in the layout drawing provided by the estimator. Space wall mounting brackets and hangers as indicated by dimensions d, e and f in the relevant Layout Overview drawing for your heater. For Linear heaters *see Page 15, Figure 19*, for Double Linear heaters *see Page 18, Figure 21* and for u-tube heaters *see Page 28, Figure 23*.

Model	Quantity of Wall Mounting Brackets	Model	Quantity of Wall Mounting Brackets
HE15UT	2	HE15ST	3
HE20UT	3	HE20ST	4
HE25UT	3	HE25ST	4
HE30UT	3	HE30ST	5
HE35UT	3	HE35ST	5
HE40UT	3	HE40ST	5
HE45UT	4	HE45ST	6
HE50UT	4	HE50ST	6

10.7.1 Hardware Installation

The wall mounting brackets must be attached to a suitable wall through all mounting holes. Screw sizes less than M8 (5/16") may not be used. In order for the wall mounting brackets to adequately carry the weight of the heater, it must be installed with best building practice.

Figure 26: U-tube (Horizontal)

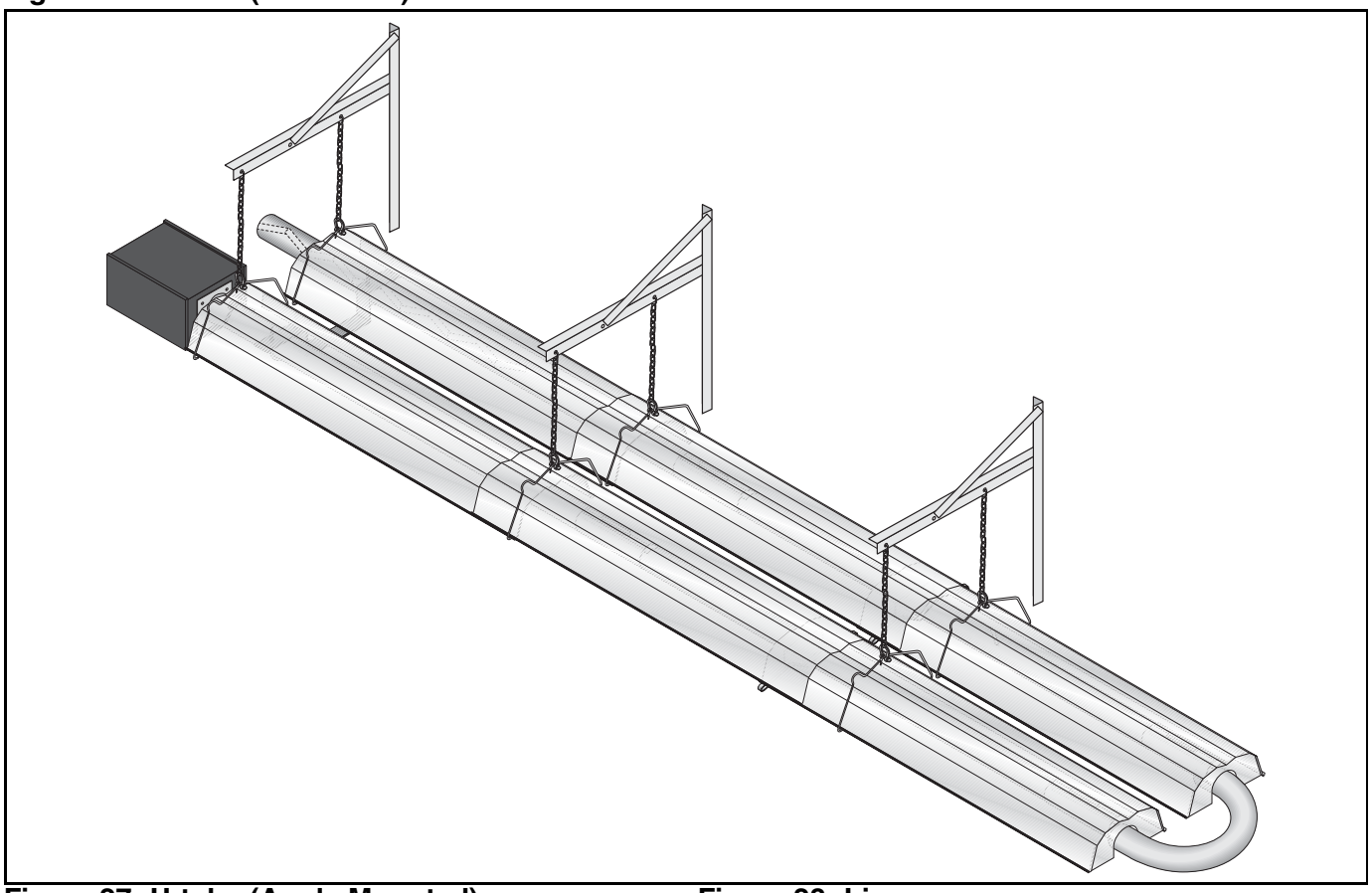


Figure 27: U-tube (Angle Mounted)

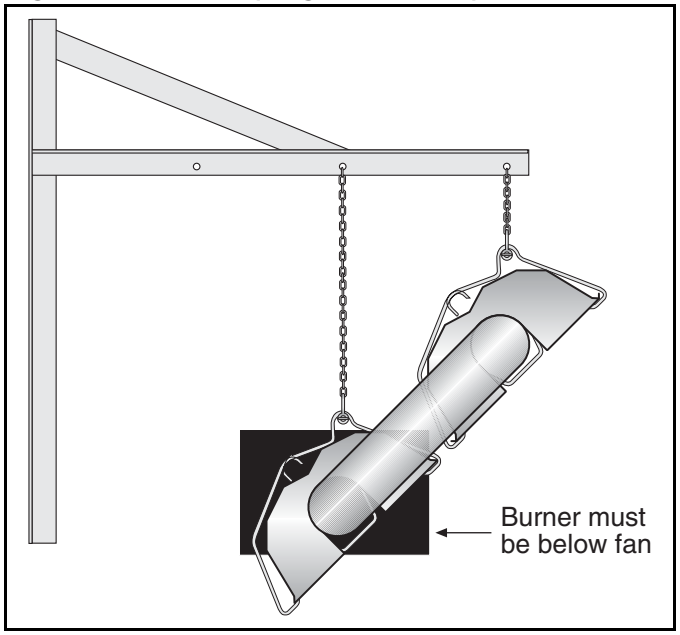
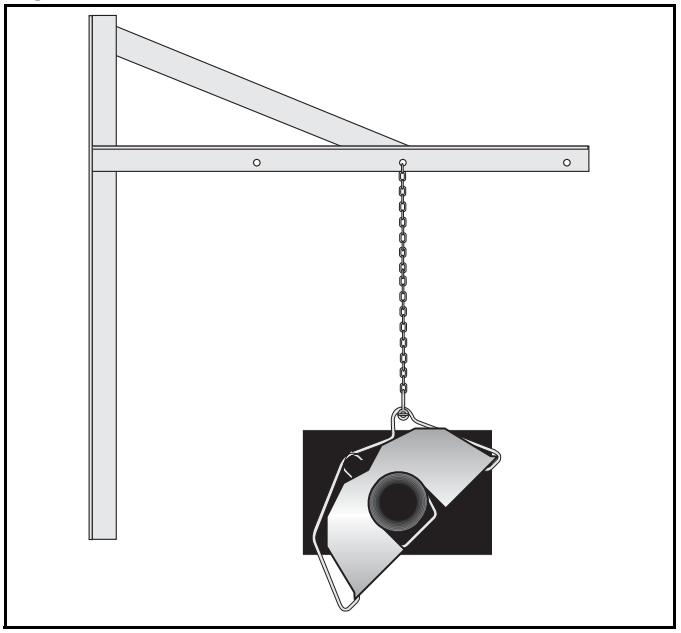


Figure 28: Linear



SECTION 11: VENTING AND FRESH AIR SUPPLY

⚠WARNING

Carbon Monoxide Hazard

Multiburner systems are not approved for unvented use and must be vented outdoors.

Unitary heaters installed unvented must be interlocked with sufficient building exhaust.

Heaters must be installed according to the installation manual.

Failure to follow these instructions can result in death or injury.

⚠WARNING

Cut/Pinch Hazard

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

11.1 General Venting

Flue materials are not included with the heater.

11.2 Type C_{12} , C_{32} & C_{62} Appliance

Room Sealed

The heaters are designed to be installed as room sealed appliances. The flue and air intake are run as separate pipes to the special concentric wall or roof terminal. *See Page 51, Figure 31*.

11.3 Type B_{22} Appliance

The flue must be fitted with a low resistance terminal. *See Page 51, Figure 31*.

11.4 Flue Installation

The fan outlet may discharge vertically or horizontally. Connection should be made using 100 mm minimum diameter Aluminium or Stainless Steel flue material to National Standard and must be adapted to insert into the 100 mm flue adapter. Both fresh air supply and flue duct shall not exceed 10,000 mm. HE15 and HE20 flue must be insulated if longer than 5,000 mm. HE25 flue must be insulated if longer than 8,000 mm. For each 90° bend, subtract 1,000 mm from the maximum flue length. The flue must be self supporting. Suitable terminals must be fitted for horizontal and vertical flue.

In order to locate fans that are not IP54 protected away from the wet environment, a 100 mm diameter extension tube between the heat exchanger end and fan must be installed. This length must be subtracted from the maximum flue length.

Fans	Horizontal	Vertical
83 BWLG	190 mm x 75 mm (hole)	150 mm dia.
90 BWTL	190 mm x 75 mm (hole)	150 mm dia.

11.5 Ventilation Requirements

Detailed recommendations for air supply are given in the relevant National Standards. There must be an adequate supply of air for both combustion and general ventilation. Air vents should have negligible resistance. Do not locate air vents where they can be easily blocked or flooded, or adjacent to any flues or extraction systems carrying flammable vapour.

11.6 Fresh Air Supply

The burner is equipped with a fresh air adapter which has a silicone gasket incorporated. This adapter accepts tubes with 100 mm outside diameter.

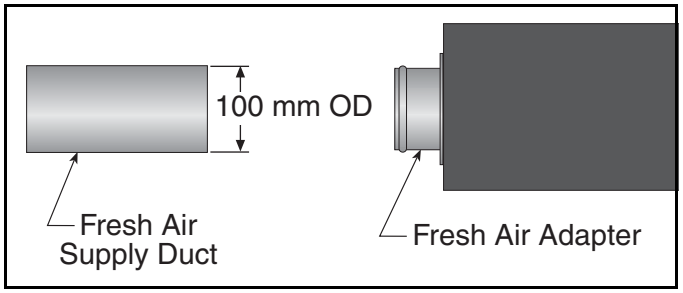


Figure 29: Individual Flue Connection Detail

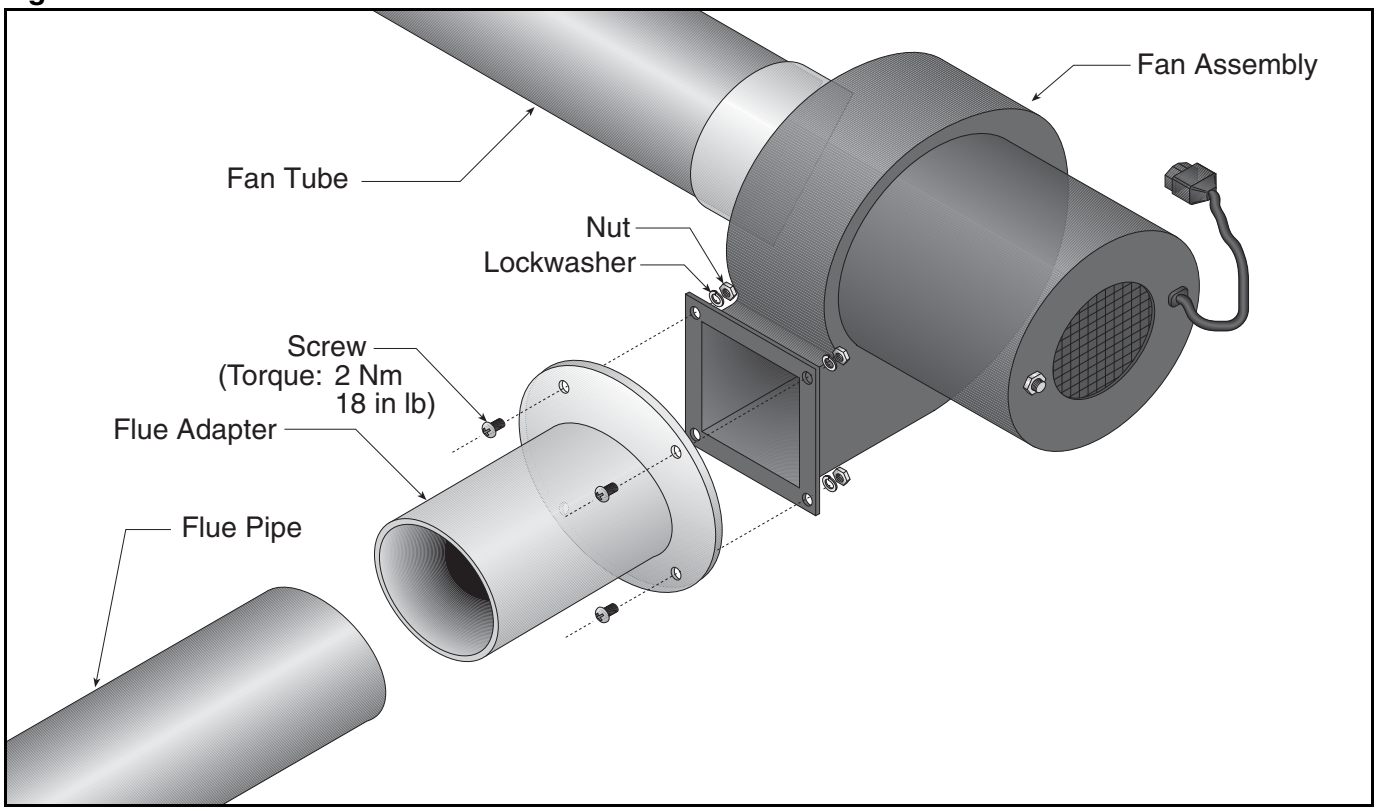
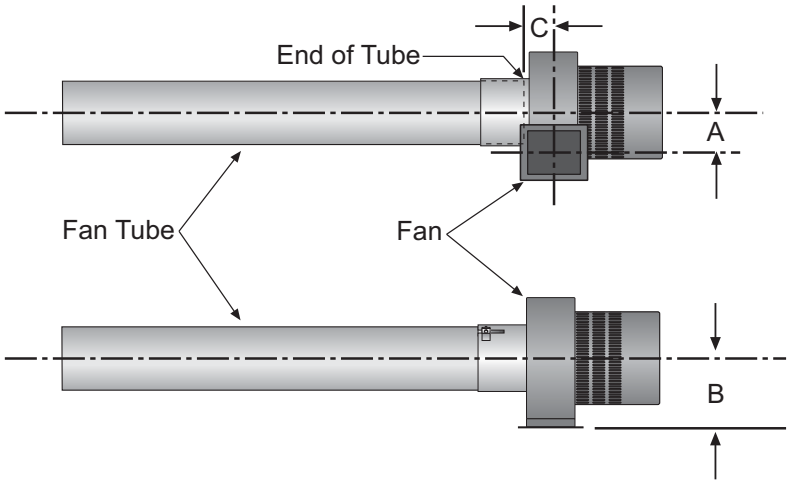


Figure 30: Flue Connection Dimensions



Fan Part Number	A	B	C
90710053 (IP55)	82 mm	101 mm	38 mm

11.7 Outside Combustion Air Supply

Clean air must be ducted into the burner box through the 100 mm diameter spigot on the back of the burner box.

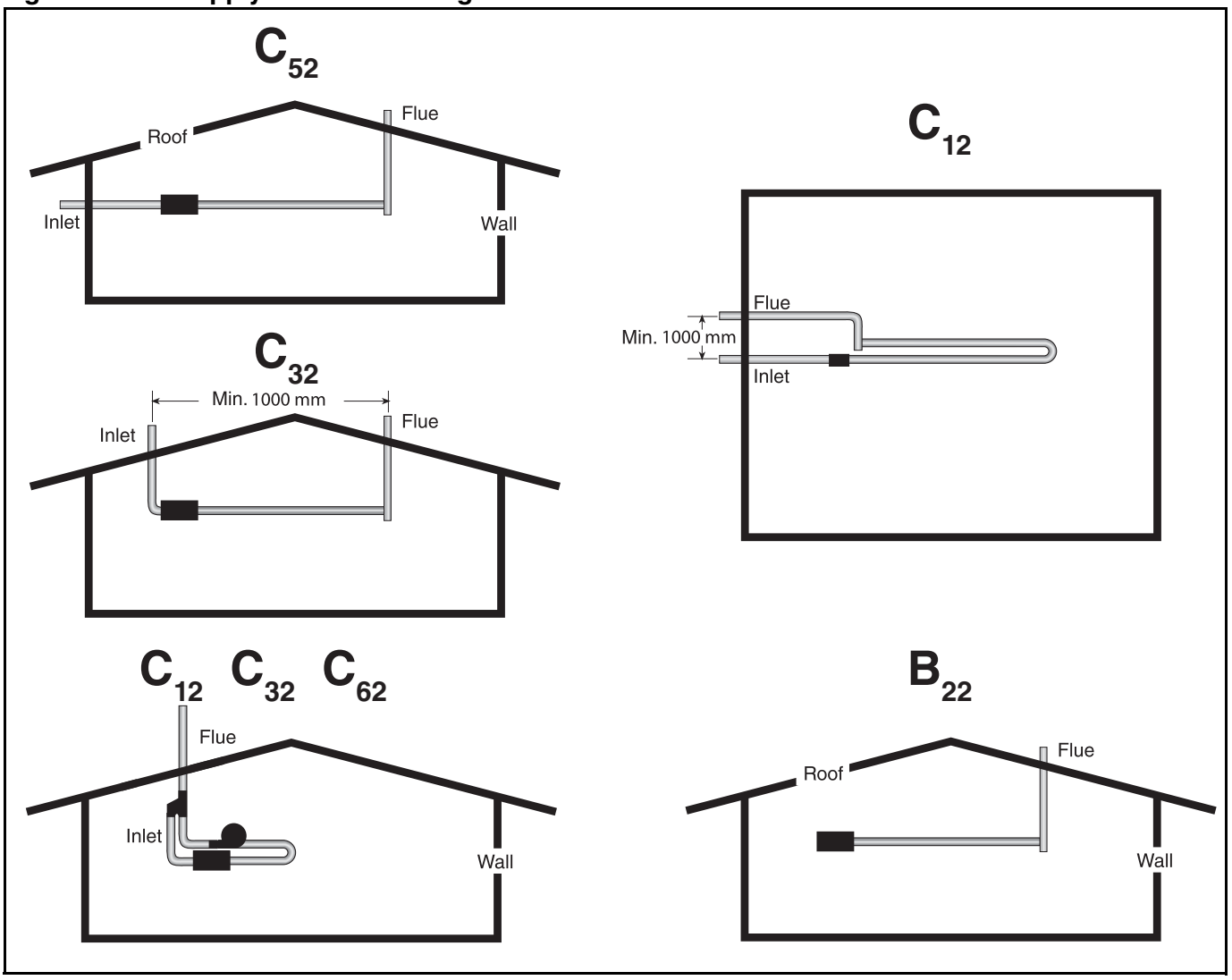
See Page 49, Section 11.4 for recommendations on duct length. Air duct should be as straight as possible. Consult the manufacturer if more than 1 x 90° bend is necessary. The fresh air duct must be self supporting.

11.7.1 Air Supply Requirements

When fresh air duct is used, follow one of these rules:

- The flue must penetrate the roof while fresh air can penetrate any wall. (*See Page 51, Figure 31*).
- The flue and fresh air supply must penetrate the roof at a minimum of 1,000 mm apart. (*See Page 51, Figure 31*).
- The flue must penetrate 1,000 mm higher than the fresh air inlet on the same wall. (*See Page 51, Figure 31*).

Figure 31: Air Supply with Flue Configurations



11.8 Common Duct

When using a common air inlet duct, always ensure that the area of the common air inlet duct represents the area of all air ducts.

SECTION 12: GAS PIPING

⚠WARNING

Fire Hazard

Tighten gas line fittings to connect gas supply according to Figure 32.

Flex gas line can crack when twisted.

Gas line moves during normal operation.

Use only 1000 mm long connector of 1/2" or 3/4" nominal ID.

Failure to follow these instructions can result in death, injury or property damage.

⚠WARNING

Explosion Hazard

Leak test all components of gas piping before operation.

Gas can leak if piping is not installed properly.

Do not high pressure test gas piping with heater connected.

Failure to follow these instructions can result in death, injury or property damage.

It is important that the gas supply pipe and electrical connections do not support any of the heater's weight.

Installation pipes should be fitted in accordance with National Standards. Pipe work from the meter to the heater(s) must be of adequate size. Pipes of smaller size than the heater inlet gas connection should not be used.

Install the gas hose as shown *on Page 53, Figure 32*. The gas hose accommodates expansion of the heating system and allows for easy installation and service of the burner. Before connecting the burners to the supply system, verify that all high pressure testing of the gas piping has been completed.

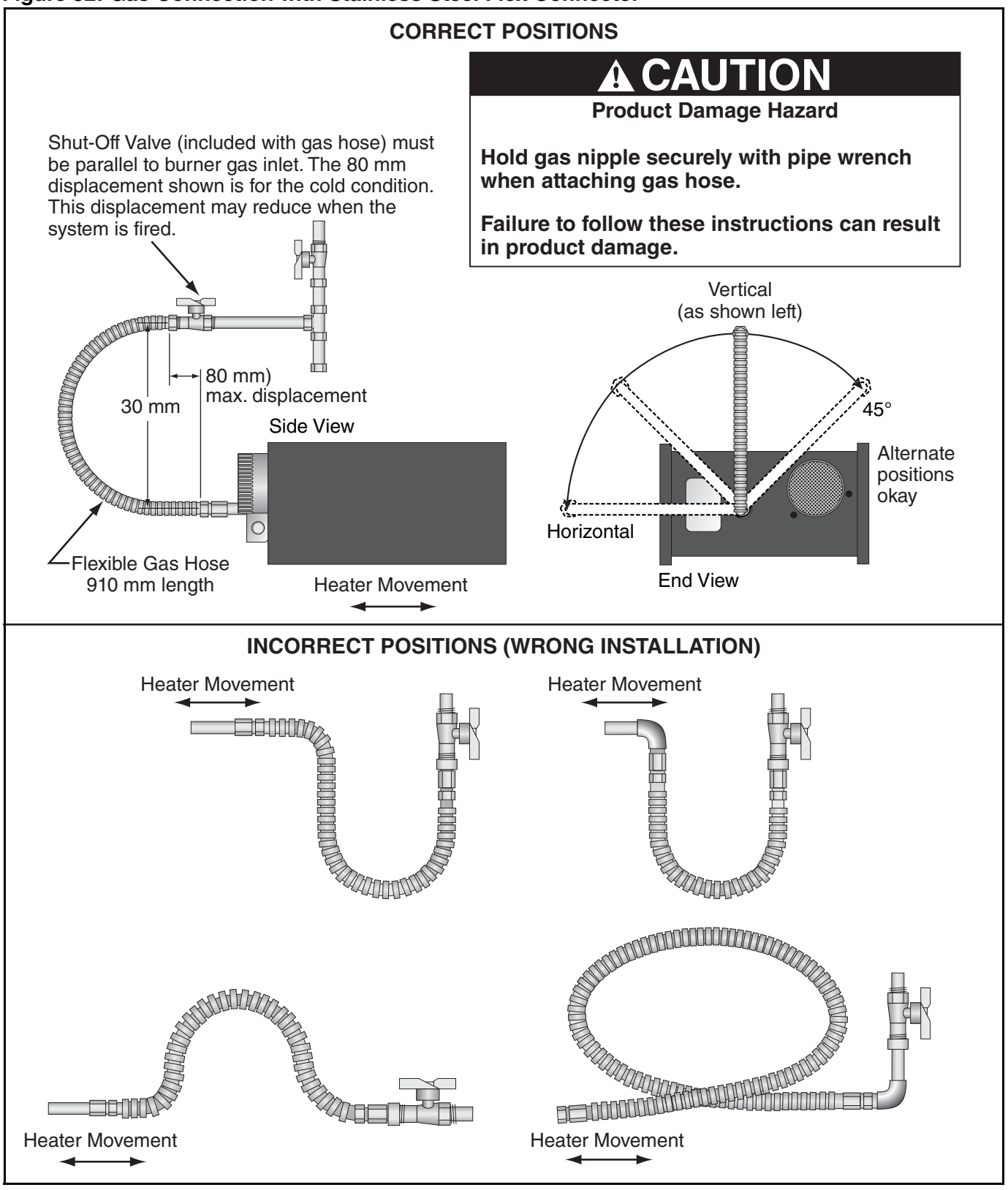
There is an expansion of the tube with each firing cycle. This will cause the burner to move with respect to the gas hose. This can cause a gas leak resulting in an unsafe condition if the gas connection is not made in strict accordance with *Figure 32*.

Meter and service must be large enough to handle all the burners being installed plus any other connected load. The gas hose which feeds the system must be large enough to supply the required gas with a maximum pressure drop of 13 mm wc. When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

IMPORTANT - the complete installation must be tested for gas soundness and be purged in accordance with local and national codes.

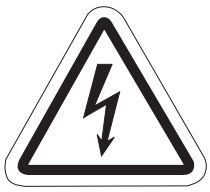
- **Check the pipe and tubing ends for leaks before placing heating equipment into service. When checking for gas leaks, use a soap and water solution; never use an open flame.**

Figure 32: Gas Connection with Stainless Steel Flex Connector



SECTION 13: WIRING

⚠ DANGER



Electrical Shock Hazard

Disconnect electric before service.

Heater must be properly grounded.

Failure to follow these instructions can result in death or electrical shock.

Connect to the electrical supply using the power wire coming out of the wire gland via a locally mounted IP55 protected double pole fused switch having a minimum disconnection of 3 mm on each pole. This switch should be fused to 3 amps. There are no control connections in the standard burner. Control is affected by interruption of the main power inlet. *See Page 54, Section 13.1 through Page 55, Section 13.4* for the external wiring details for the single-burner, double linear and multiburner heater systems.

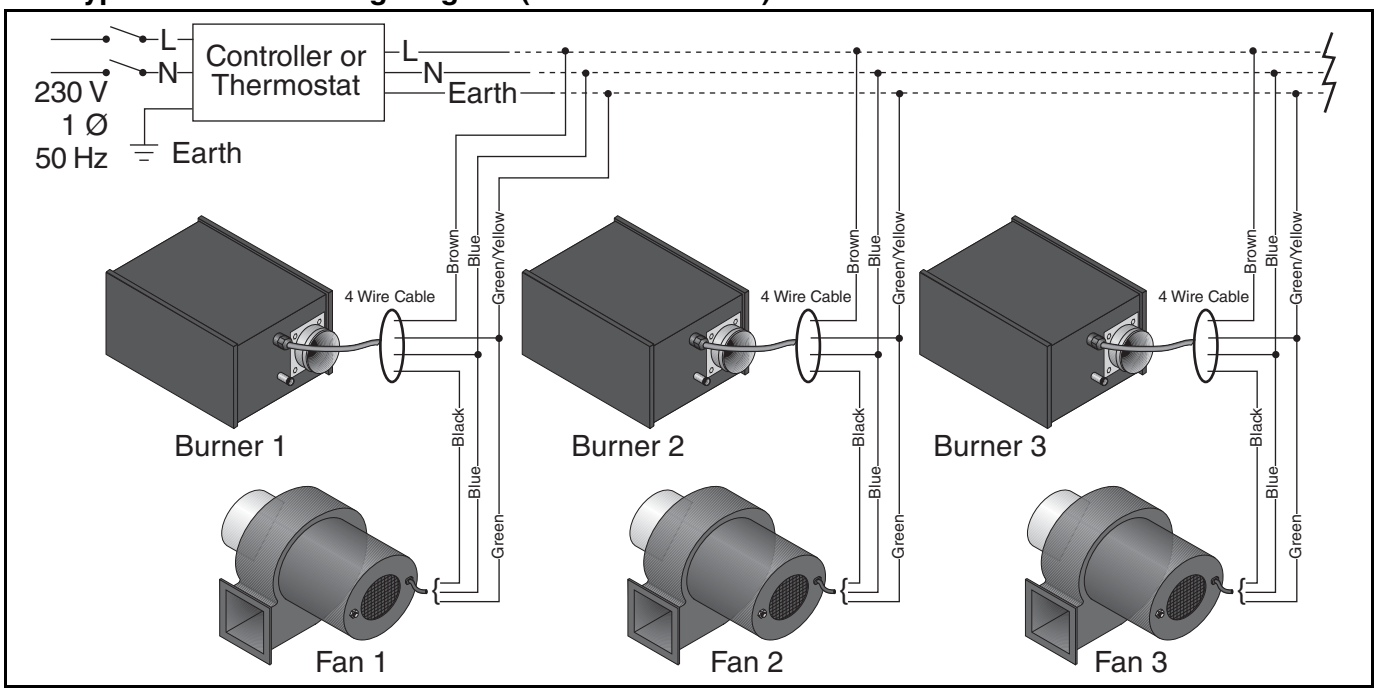
If the IP55 protected fan MB 56 2BM is used with a single burner (linear or U-tube), it must be wired as shown *on Page 55, Section 13.2*.

The fan must be protected with a 3 A fuse.

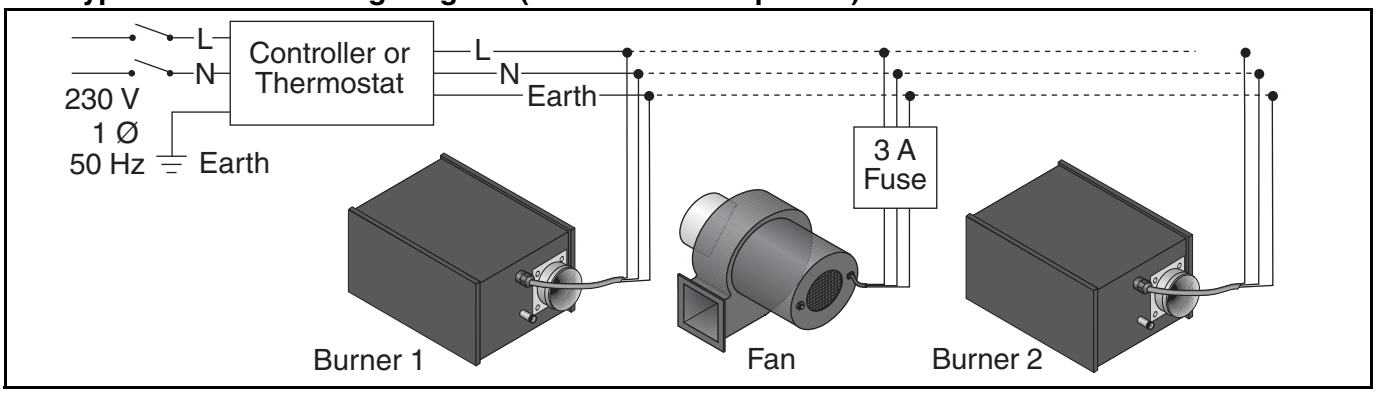
All wiring must comply with current wiring regulations and any local regulations which may apply. Always switch off the supply to the burner before removing the burner side panel.

For lockout indication, establish connection inside burner with grey wire and ignition module connection CON 5 Pin 4.

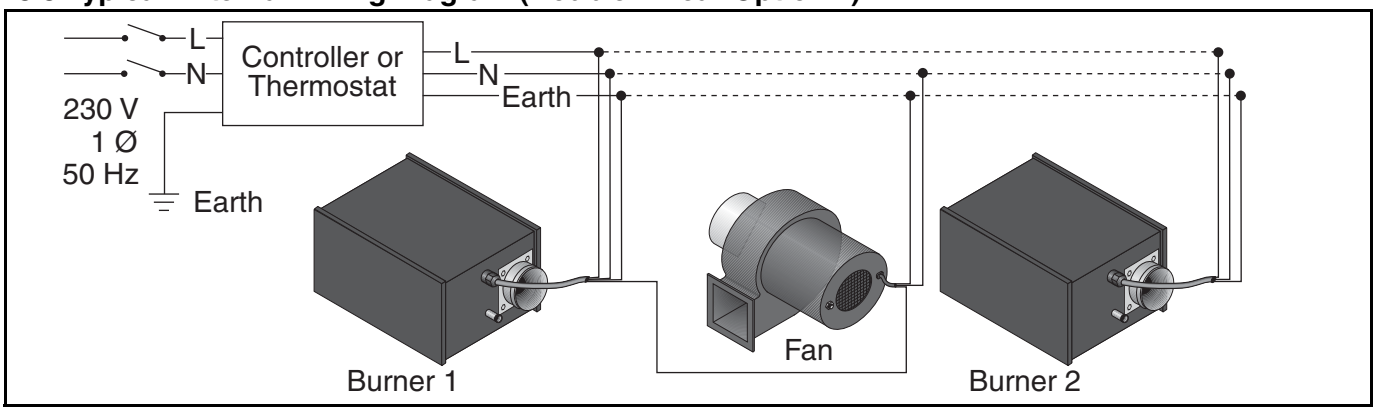
13.1 Typical External Wiring Diagram (Linear or U-Tube)



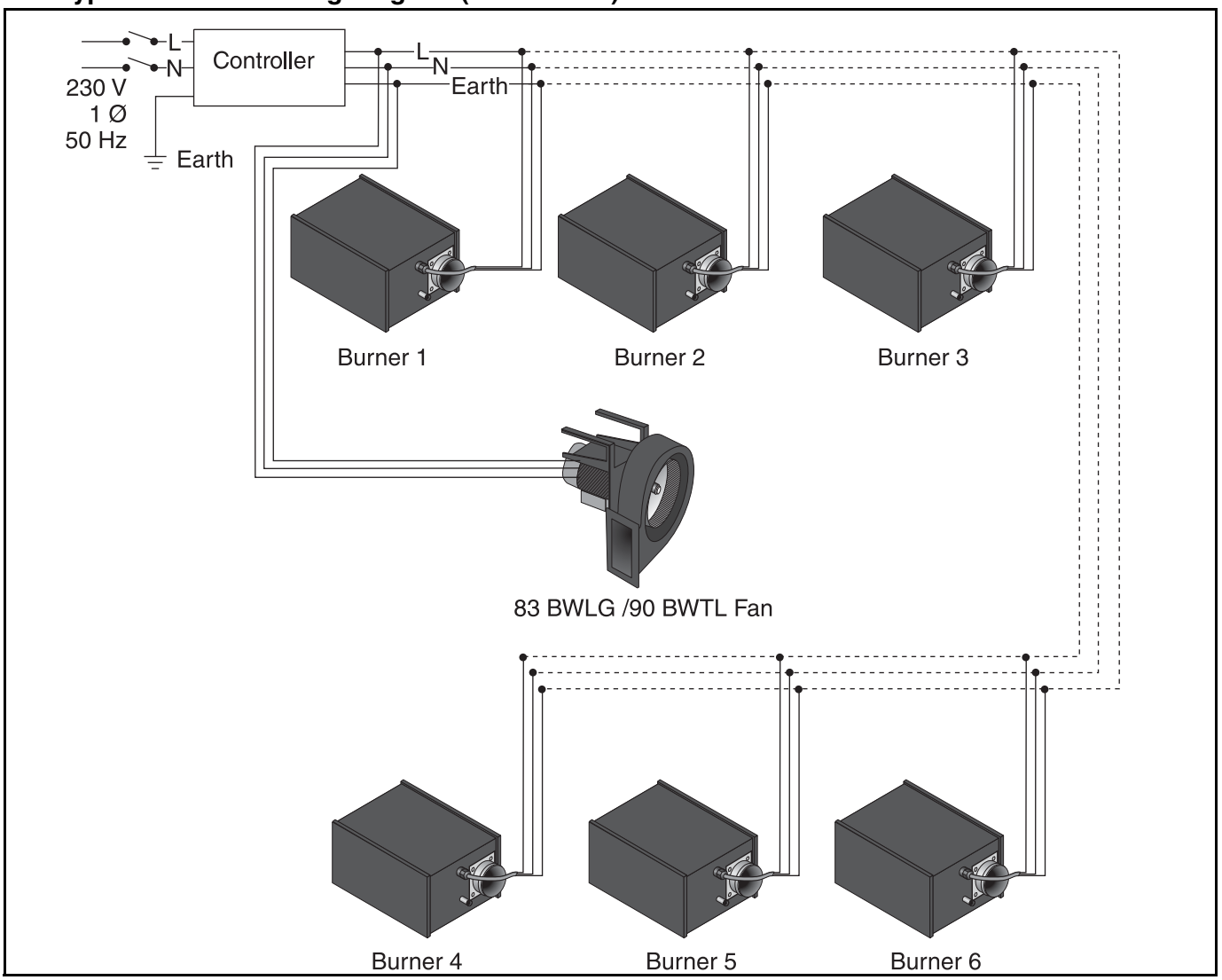
13.2 Typical External Wiring Diagram (Double Linear Option 1)



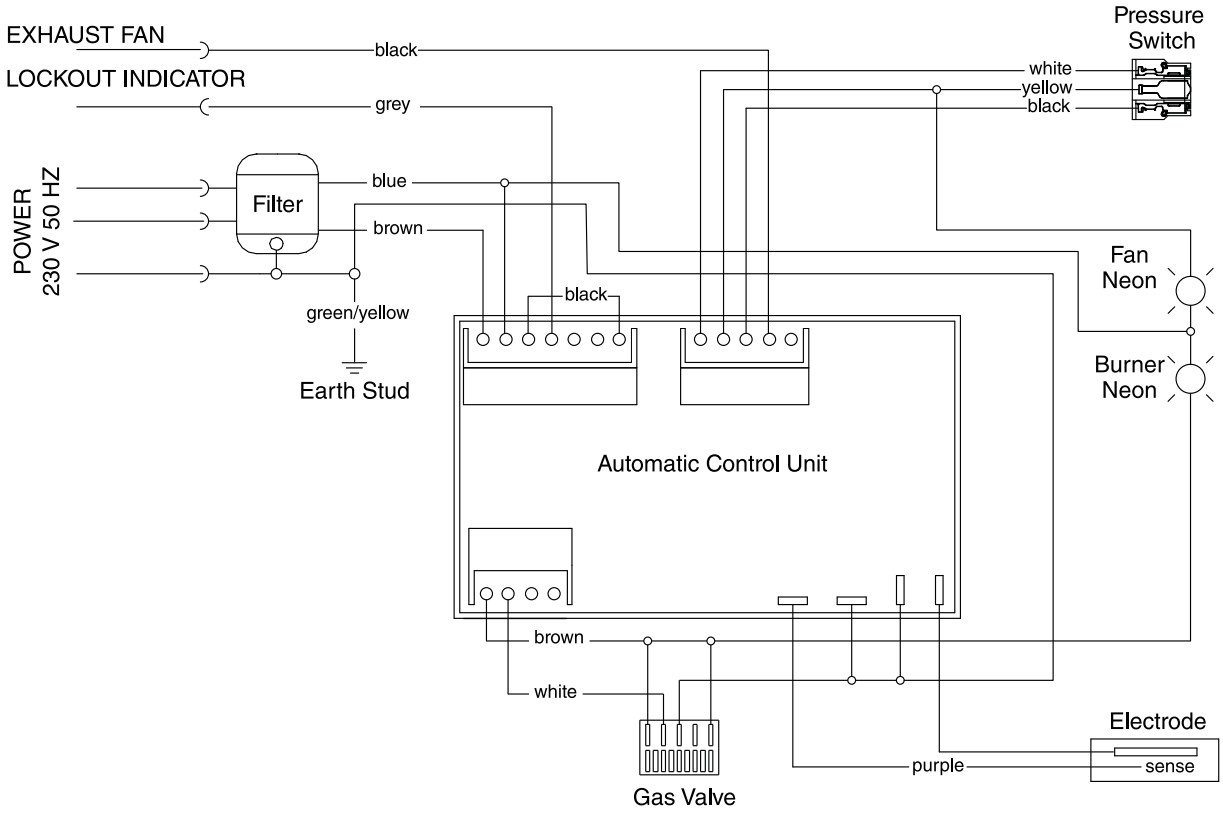
13.3 Typical External Wiring Diagram (Double Linear Option 2)

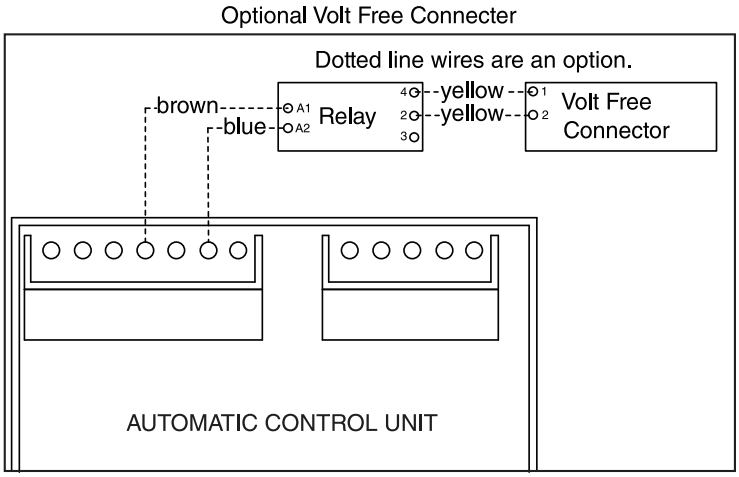


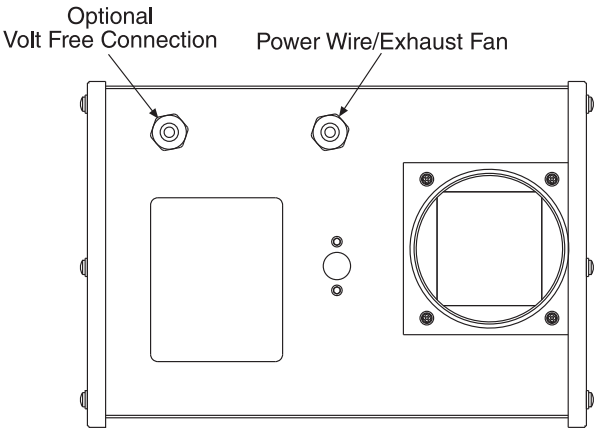
13.4 Typical External Wiring Diagram (Multiburner)



13.5 Internal Wiring Diagram







If any of the original wire supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 105° C and 600 V.

Note: In the event of a lockout condition, 230 VAC will be present at the lockout indicator. If not used, this wire must be properly insulated.

SECTION 14: OPERATION

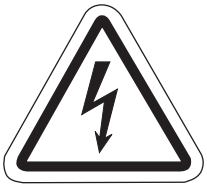
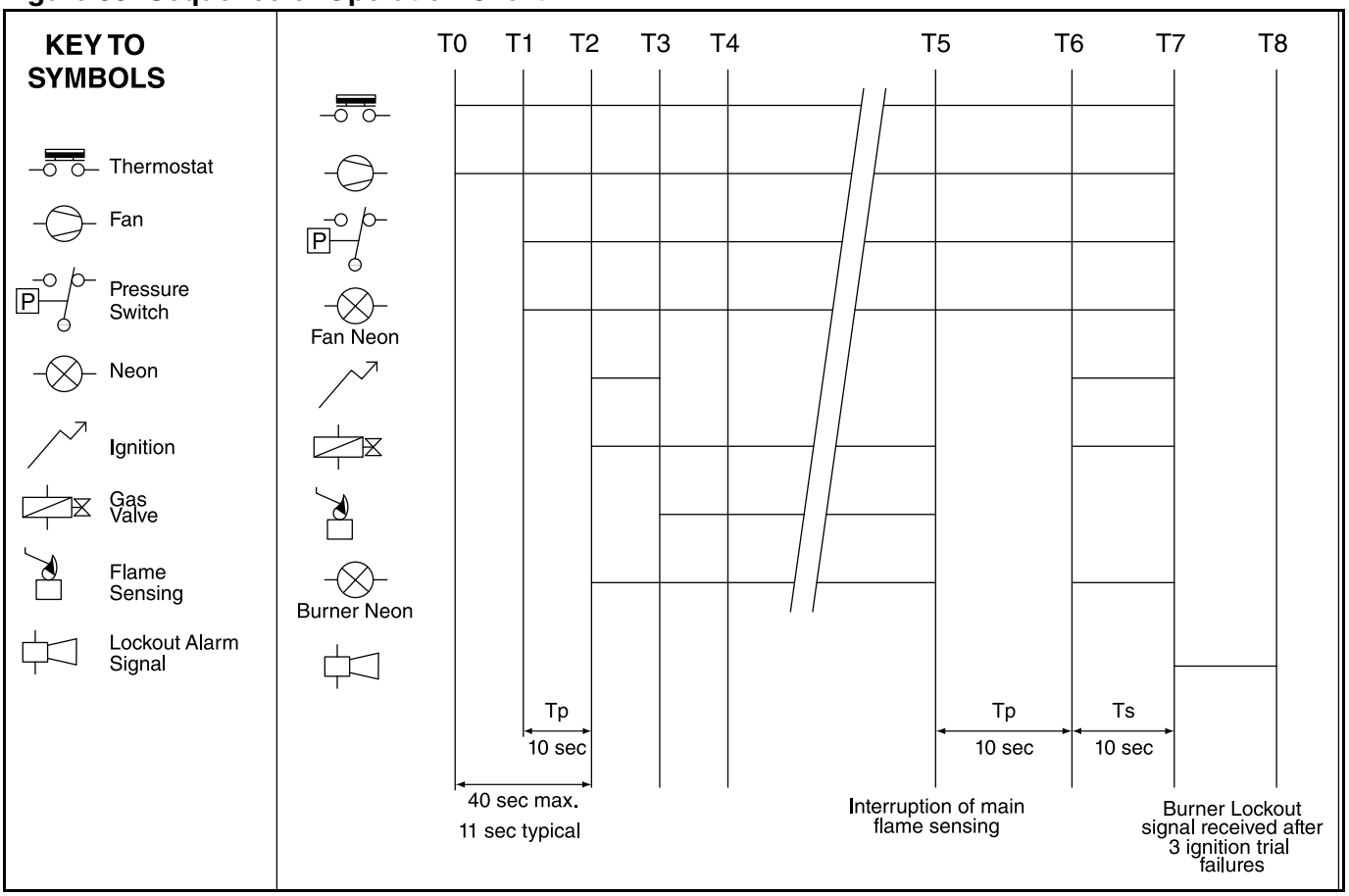
⚠ DANGER	⚠ WARNING		
			
Electrical Shock Hazard **Disconnect electric before service.** **More than one disconnect switch may be required to disconnect electric from heater.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

Figure 33: Sequence of Operation Chart



NOTE: If the heater operates for more than 24 hours continuously, the ignition module will automatically recycle the burner to ensure that all safety functions are still in working condition.

14.1 Heater Lockout Indication

In case of flame loss during operation of the heater, the burner control unit goes to lockout mode after three ignition trials. At this stage a signal or closed relay will enable the ROBERTS GORDON® controller, BMS system, etc. to indicate precisely which heater has failed. This can be done by two options.

14.1.1 Heater Lockout Indicator by Connector

A 230 V signal is provided which enables the ROBERTS GORDON® controller, BMS system, etc. to indicate the heater that has failed. An additional wire has to be installed from the heater lockout indicator connector to the monitoring computer. *See Page 56, Section 13.5*.

14.1.2 Heater Lockout Indicator by Volt Free Connector (Optional)

A volt free contact relay is closed which enables the ROBERTS GORDON®controller, BMS system, etc. to indicate the heater that has failed. An additional wire has to be installed from the heater volt free connector to the monitoring computer. *See Page 56, Section 13.5*.

Description	Part Number
Connector male - Volt Free	91324000
Connector female - Volt Free	91324001
Wire Blue 7"	91300004
Wire Brown 7"	91300005
Wire Yellow 12"	91300003
Screw #8 x 3/8 Hex Wshr PHH Type 23	94961406
Base relay P2RF05E	C1050B
Relay G2R1-SN IMO 220 V 10 A	C1049B

14.2 Testing

Establish that a satisfactory purged gas supply and an electrical supply is available to the heater. Ensure that all time clocks and thermostats are set to call for heat.

With the gas supply cut off and the electrical supply isolated by switching off at the local switch, open the control chamber secured by the screws. Loosen the sealing screw from the pressure test point and remove the cover cap from the governor.

Turn on the gas supply and connect appliance electrical plug. Ensure that the timer or thermostat, if fitted, are set to call for full gas rate. Switch on at the local switch. The sequence as described should take place. If not, refer to detailed fault finding sequence. When flame is established, check the gas pressure reading and adjust if necessary. Refer to burner data label.

Check the gas pressure at the outlet of the gas valve. *See Page 73, Section 18.10.1* for pressure settings or refer to the data plate.

Switch off the electrical supply (shutting down the heater), remove pressure gauge, tighten pressure test point screw, ensuring a tight gas seal. Replace governor cover cap. Replace control chamber door.

14.3 Commissioning (Multiburner)

1. Establish that a satisfactory purged gas supply and an electrical supply is available to the heater.

2. ENSURE that all the dampers are in the fully open position.

3. With the gas supply off at each of the burners and the electrical supply isolated, open the control chamber secured by six screws.

4. Ensure that all time clocks and thermostats are set to call for heat.

5. Switch on the electrical supply at the main isolator. This will start the exhaust fan.

6. **Balancing Cold Suction**
   Check each burner vacuum by connecting an inclined pressure gauge to the tee on the pressure switch inlet side in the burner. Adjust the damper so that the suction is 1.9 mbar. Repeat for each burner.

7. Start at the end burner (furthest from the exhaust fan) with the inclined pressure gauge connected as described above. Turn on the gas and electrical supply, reset the pressure switch by removing suction from the inlet side of the pressure switch waiting several seconds and reconnecting. The start up sequence described *on Page 57, Section 14* should take place. If not, refer to detailed fault finding sequence. When flame is established, check the gas pressure reading and adjust if necessary. See data label.
   Check the gas pressure at the outlet of the gas valve. *See Page 73, Section 18.10.1* for pressure settings or refer to the data plate.
   Switch off the electrical supply (shutting down the heater), remove pressure gauge, refit pressure test-point screw, ensuring a tight gas seal. Replace governor cover cap.
   Repeat this procedure for each burner in the system.
   Close the control chamber and secure with six screws.

8. **Balancing Hot Suction**
   Reconnect all the burners on the system and allow them to reach full operating temperature (approximately 20 minutes). Return to each burner and recheck the hot suctions at the tee on the inlet to the pressure switch. Re-adjust the damper so that the hot suction of 1.7 mbar is achieved and lock the damper in position.

14.4 System Checks

Switch on again at the local switch to help ensure smooth ignition. Carry out the following system checks:

When running, turn off the gas supply at the appliance. The heater will immediately shut down followed by one attempt at restoration followed by lockout.

Linear and Double Linear only:

When running, disconnect the fan plug from the burner. The unit should shut down within three seconds, proving operation of the pressure switch.

14.5 User Instructions

After satisfactory testing, ensure that the client is fully aware of the operation of the system. Bring this manual to the attention of the user or purchaser; instruct them in the safe operation of the heater(s).

SECTION 15: SERVICING INSTRUCTIONS

⚠ DANGER	⚠ WARNING		
Electrical Shock Hazard **Disconnect electric before service.** **More than one disconnect switch may be required to disconnect electric from heater.** **Heater must be connected to a properly grounded electrical source.**	**Explosion Hazard** **Turn off gas supply to heater before service.**	**Burn Hazard** **Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Cut/Pinch Hazard** **Wear protective gear during installation, operation and service.** **Edges are sharp.**
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

IMPORTANT: Never use the heater as a support for ladders or other access equipment. Always test for gas soundness with a suitable detection fluid after completing any servicing or exchange of gas carrying component. On completion of any service/fault finding tasks which require the breaking and remaking of electrical connections, the checks:- A: Earth Continuity, B: Polarity and C: Resistance to Earth must then be repeated.

15.1 Annual Procedure

Carry out the following procedure annually. The preferred time would be immediately before the winter heating period. If very dirty conditions arise, it may be necessary to carry out this procedure more often. If the unit takes in air through an air duct or filter assembly, more frequent service may be necessary.

15.1.1 Burner and Fan Removal

Isolate the heater from the gas and electrical supplies. Remove the fan plug from the burner. Unscrew the securing screws on the burner flange. The burner can now be removed. Take care not to disturb the gasket on the flanged burner tube. Unscrew the securing screw on the fan flange spigot. The fan can now be removed.

15.1.2 Burner and Fan Removal Maintenance

Remove the fan and burner independently to floor level and clean both items internally using a soft brush and compressed air, if available. Take care not to damage the internal parts of the burner. Check fan impeller for cleanliness and free rotation.

The electrodes are an integral part of the burner. To check spark gap, remove the securing screws on the electrode and withdraw it ensuring the gasket is not damaged. Spark gap on electrode should be approximately 3 mm.

15.1.3 Tube and Reflector Maintenance

With burner and fan removed, clean the outer surfaces of the tubes using a brush and wipe the inner surface of the reflector with a soft damp cloth - use a household detergent if necessary. Never use abrasive cleaners on the reflectors. Reassemble the burner and fan in reverse order. Carry out the Testing Procedure. *See Page 58, Section 14.2*.

15.2 Sealing Gaskets

During annual service, all gaskets, as indicated *on Page 68, Section 17*, must be inspected for cuts, misalignment or dryness. All round rubber gaskets, sealing the screw holes, must be replaced in three year intervals or earlier as needed. All other gaskets must be replaced every five years or earlier as needed.

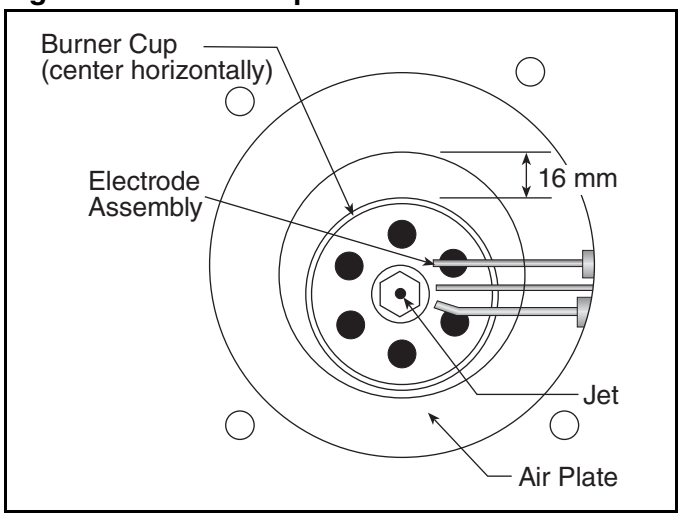
Old gaskets must be removed completely before installing the new gasket. When replacing gaskets on screws, ensure that the screws are not over tightened. Deformation of the gasket is an indication of suffcient torque. The control and combustion chamber doors have internal seals, replacements must be attached to the same location.

15.3 Component Removal

First, isolate the heater from the gas and electricity supply.

Entry to the burner assembly is gained by removing the six door screws and removing the control chamber door. Entry to the combustion chamber is gained by removing the combustion chamber door.

15.3.1 Electrode
Figure 34: Burner Cup Position



15.3.2 Burner Head/Injector Jet
When the cover is removed completely, the burner assembly is exposed. Unscrew the burner cup. Remove brass injector jet (orifice). Replace in reverse sequence.

15.3.3 Solenoid Valve/Governor
Remove burner head. Unscrew two screws securing the solenoid/governor body. Withdraw the electrical connector and remove the flexible gas line connector. The solenoid/governor and fittings can now be withdrawn from the compartment. To ensure IP55 protection, replace the gasket on the gas valve inlet flange (P/N 03200100).

The solenoid(s) can be removed from the body by unscrewing central screw. Replace in reverse sequence.

15.3.4 Automatic Flame Control Unit
Remove black ignition lead. Withdraw the 10 point edge connector. Unscrew two screws from the cover. Replace if faulty. Refit in reverse sequence.

15.3.5 Pressure Switch
Disconnect the two silicone tubes. Remove electrical plug. Remove one screw which secures the pressure switch to the burner. Remove pressure switch.

Replace pressure switch, if faulty, and refit in reverse sequence ensuring that the rubber tubes are reconnected to the switch correctly.

15.3.6 Neons
Remove the two push on connectors and unscrew the nut. Replace in reverse sequence.

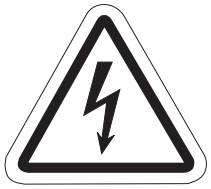
15.4 Maintenance Checklist
Installation Code and Annual Inspections:
All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Roberts-Gordon Europe Limited and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment.
To help facilitate optimum performance and safety, Roberts-Gordon Europe Limited recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon Europe Limited.

The Vicinity of the Heater	Do not store or use flammable objects, liquids or vapours near the heater. Immediately remove these items if they are present. *See Page 5, Section 3*.
Vehicles and Other Objects	Maintain the clearances to combustibles. Do not hang anything from, or place anything on, the heater. Make sure nothing is lodged underneath the reflector, in between the tubes or in the decorative or protective grilles (included with select models). Immediately remove objects in violation of the clearances to combustibles. *See Page 5, Section 3*.
Reflector	Support reflector with reflector hanger and support strap. Reflector must not touch tube. Make sure there is no dirt, sagging, cracking or distortion. Do not operate if there is sagging, cracking or distortion. Make sure reflectors are correctly overlapped. Clean outside surface with a damp cloth.

Vent Pipe	Venting must be intact. Using a flashlight, look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion. The area must be free of dirt and dust. Remove any carbon deposits or scale using a wire brush. *See Page 49, Section 11*.
Outside Air Inlet	Inlet must be intact. Look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion. The area must be free of dirt and dust. Clean and reinstall as required.
Tubes	Make sure there are no cracks. Make sure tubes are connected and suspended securely. *See Page 11, Section 5*. Make sure there is no sagging, bending or distortion.
Gas Line	Check for gas leaks. *See Page 52, Section 12*.
Burner Observation Window	Make sure it is clean and free of cracks or holes. Clean and replace as required.
Blower Scroll, Wheel and Motor	Compressed air or a vacuum cleaner may be used to clean dust and dirt.
Burner Cup and Orifice	Clear of obstructions (even spider webs will cause problems). Carefully remove any dust and debris from the burner.
Electrode	Replace if there are cracked ceramics, excessive carbon residue, or erosion of the electrode. The electrode gap should be 3 mm.
Thermostat	There should be no exposed wire or damage to the thermostat. *See Page 54, Section 13*.
Suspension Points	Make sure the heater is hanging securely. Look for signs of wear on the chain or ceiling. *See Page 11, Section 5*.
Sports Hall Guard, Decorative and Protective Grilles (optional)	The grille must be securely attached. If the grille is loose or off, contact a contractor qualified in the installation and service of gas-fired heating equipment for repair. Check that side reflector extensions are installed correctly and secured in place if necessary. (Decorative grille only.) *See Page 44, Section 10.3.3 and Page 45, Section 10.4*. Make sure shield is installed correctly and secured in place if necessary. (Decorative grille only.) *See Page 44, Section 10.3.2*.
Wall Tag	If a wall tag is present, make sure it is legible and accurate. Please contact Roberts-Gordon Europe Limited or your ROBERTS GORDON® independent distributor if you need a wall tag. *See Page 4, Section 2.1*.
Safety Labels	Product safety signs or labels should be replaced by the product user when they are no longer legible. Please contact Roberts-Gordon Europe Limited or your ROBERTS GORDON® independent distributor to obtain replacement signs or labels. *See Page 3, Figure 1 through Page 3, Figure 2*.

SECTION 16: TROUBLESHOOTING

⚠ DANGER



Electrical Shock Hazard

Disconnect electric before service.

Heater must be properly grounded.

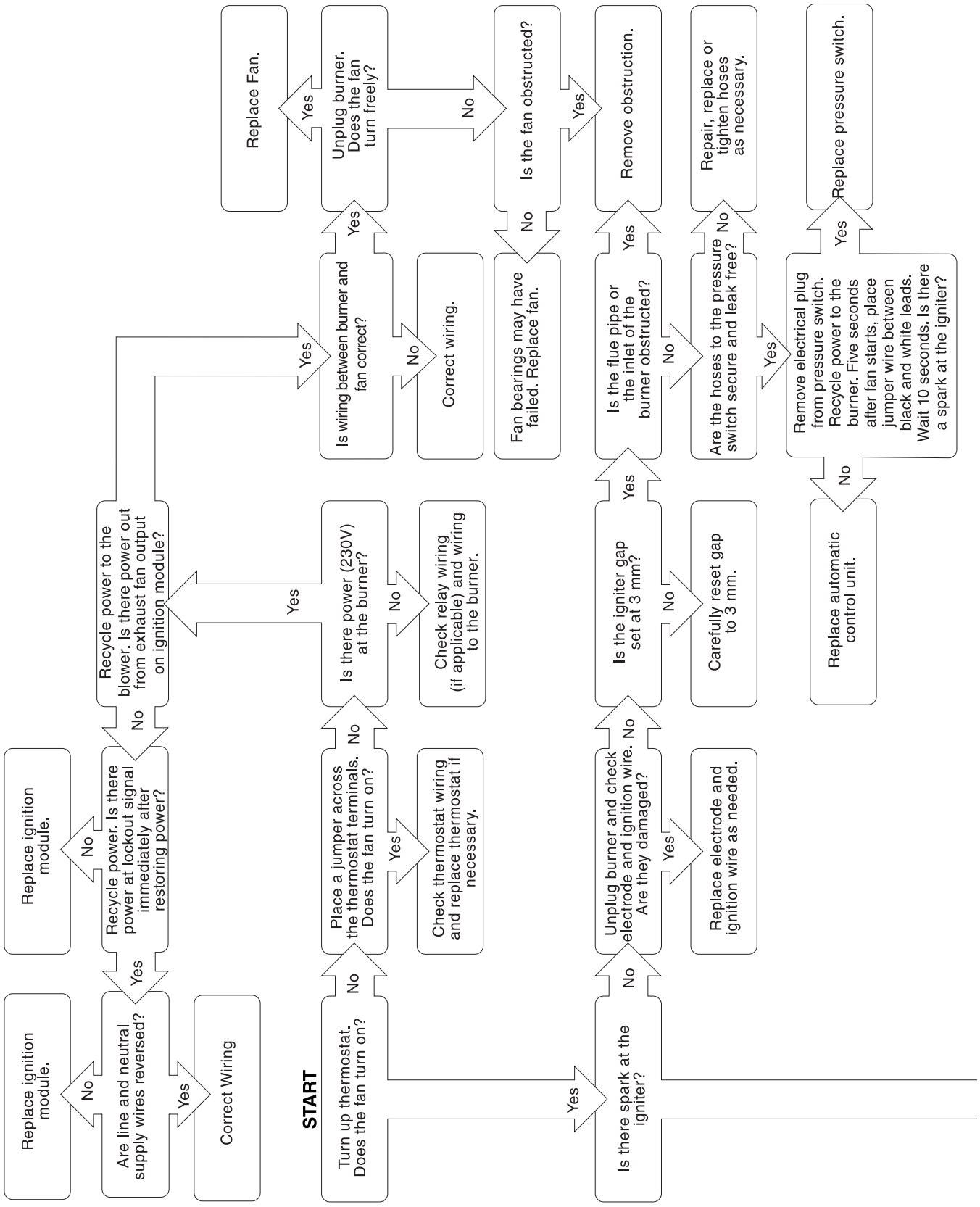
Failure to follow these instructions can result in death or electrical shock.

⚠ WARNING

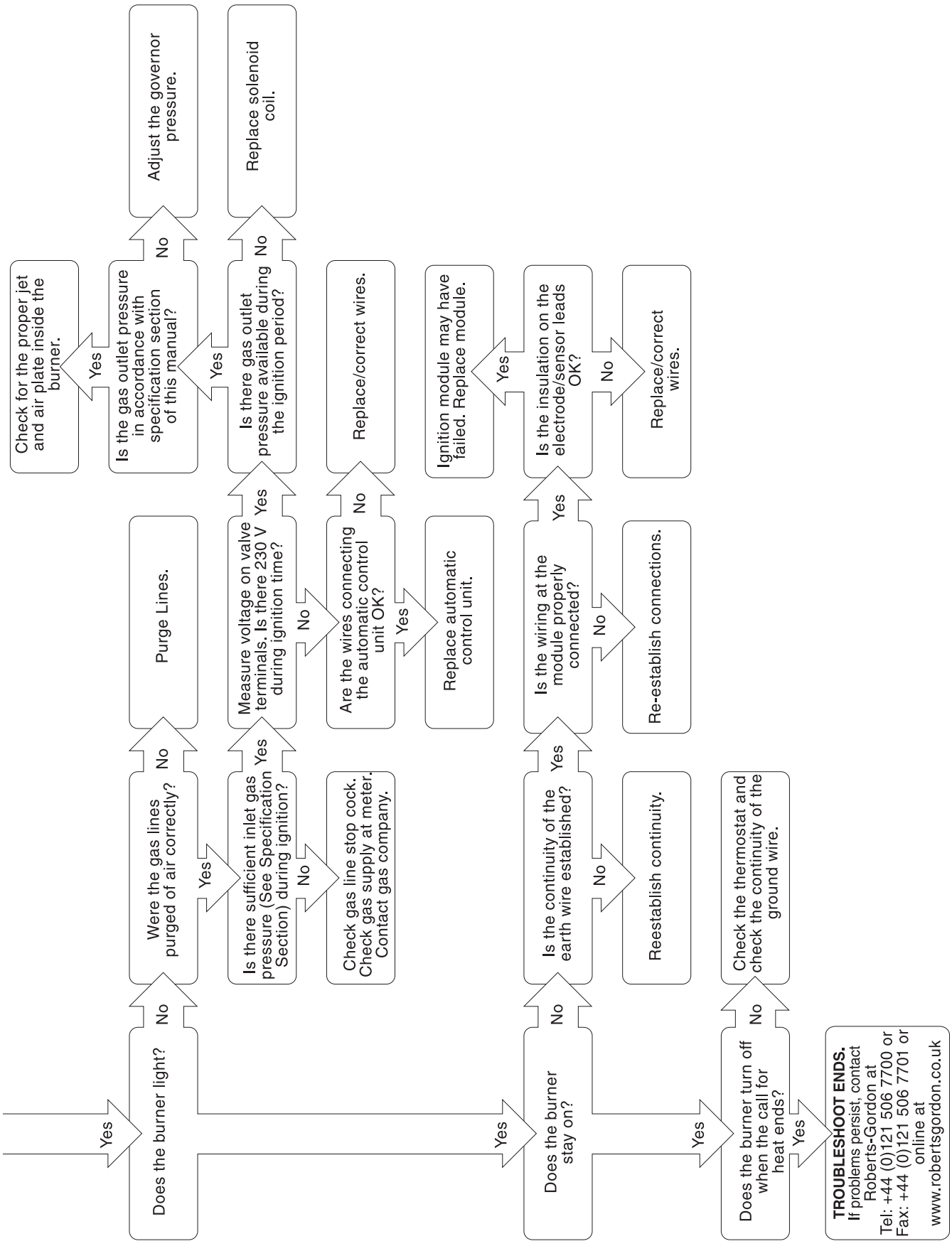
Fire Hazard	**Explosion Hazard**	**Burn Hazard**	**Cut/Pinch Hazard**
Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater. **Some objects will catch fire or explode when placed close to heater.**	**Turn off gas supply to heater before service.**	**Allow heater to cool before service.** **Tubing may still be hot after operation.**	**Wear protective gear during installation, operation and service.** **Edges are sharp.**

Failure to follow these instructions can result in death, injury or property damage.

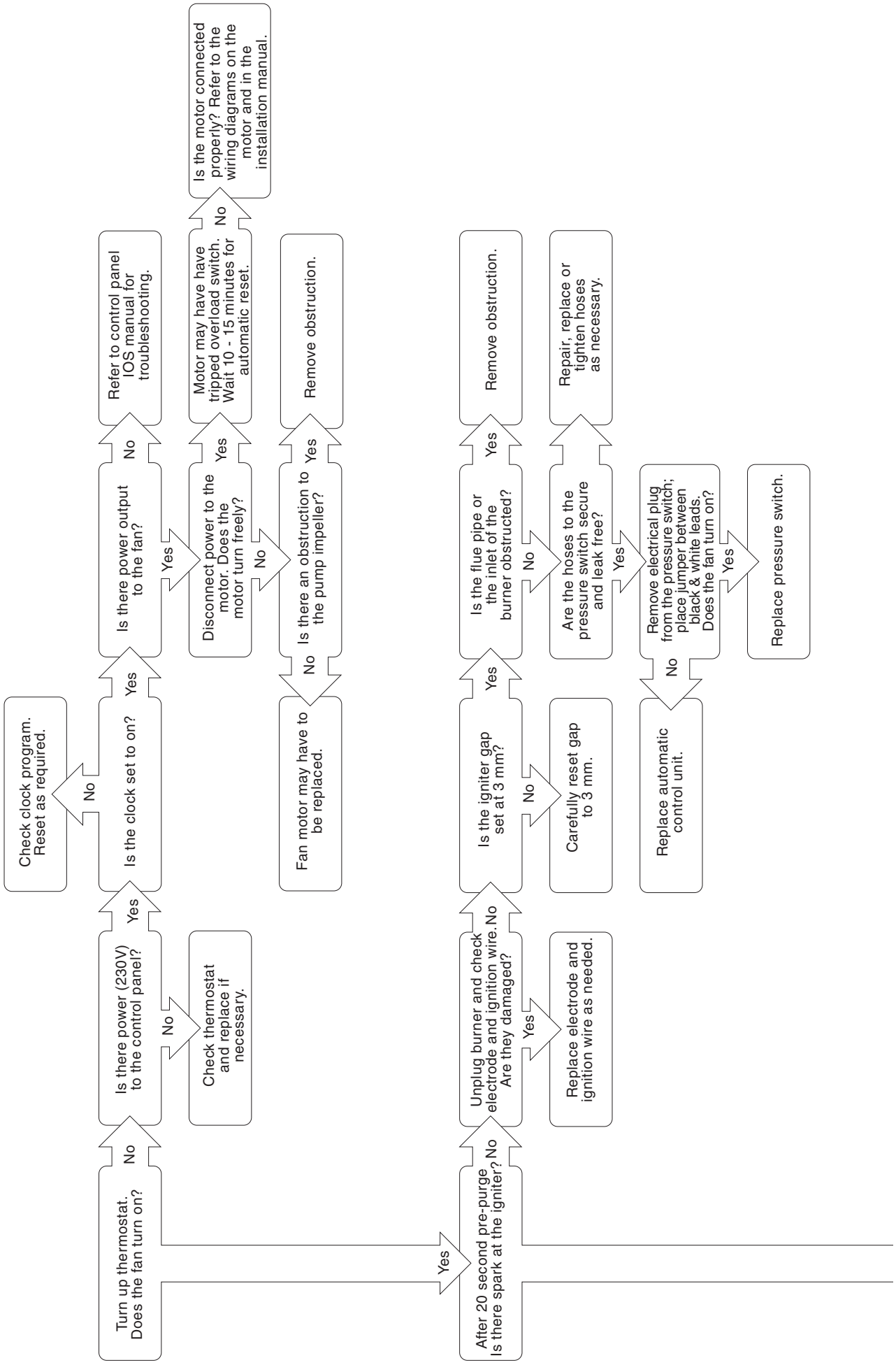
16.1 Troubleshooting Flow Chart (Linear, Double Linear and U-Tube)



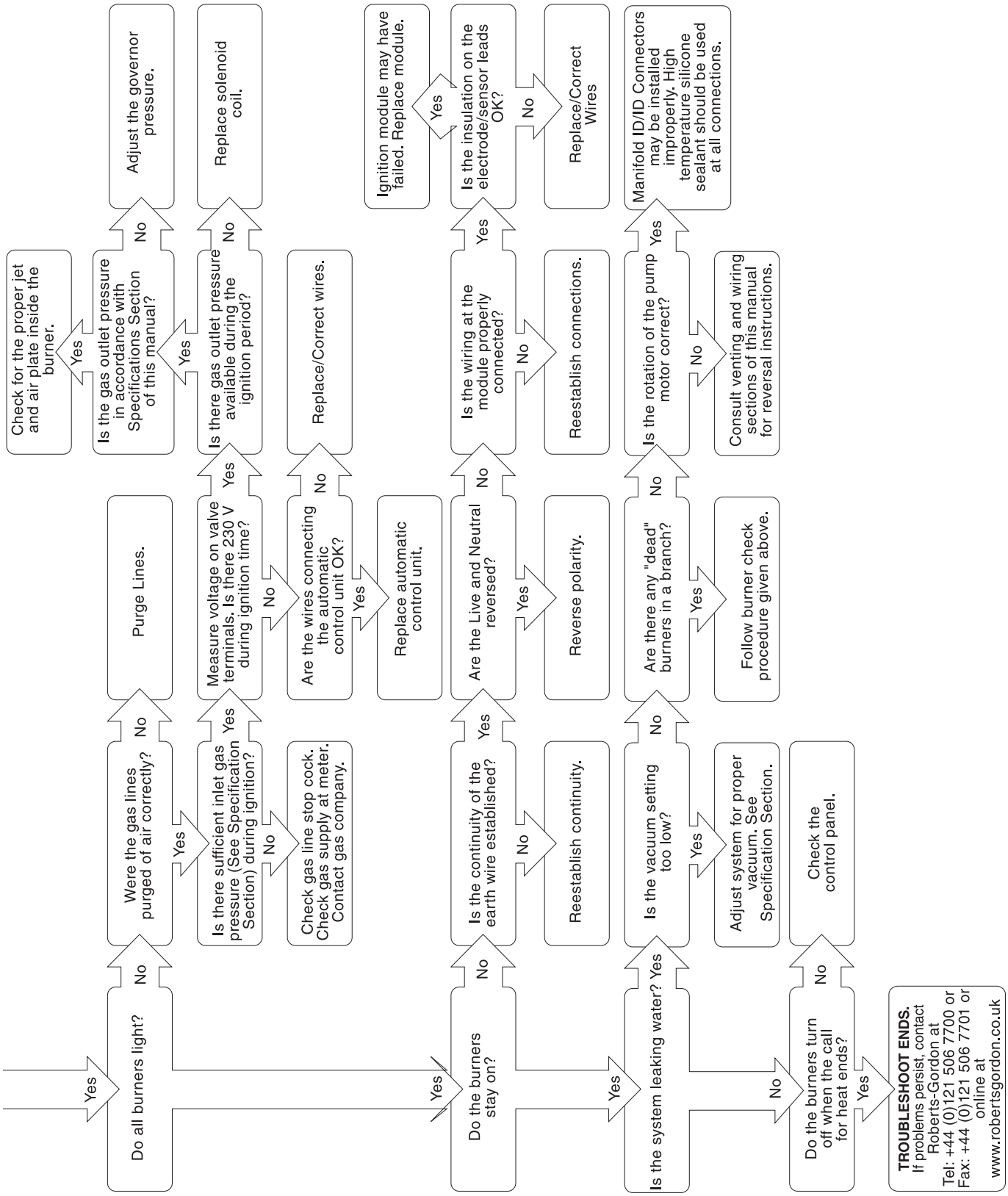
Troubleshooting Flow Chart (Linear, Double Linear and U-Tube)



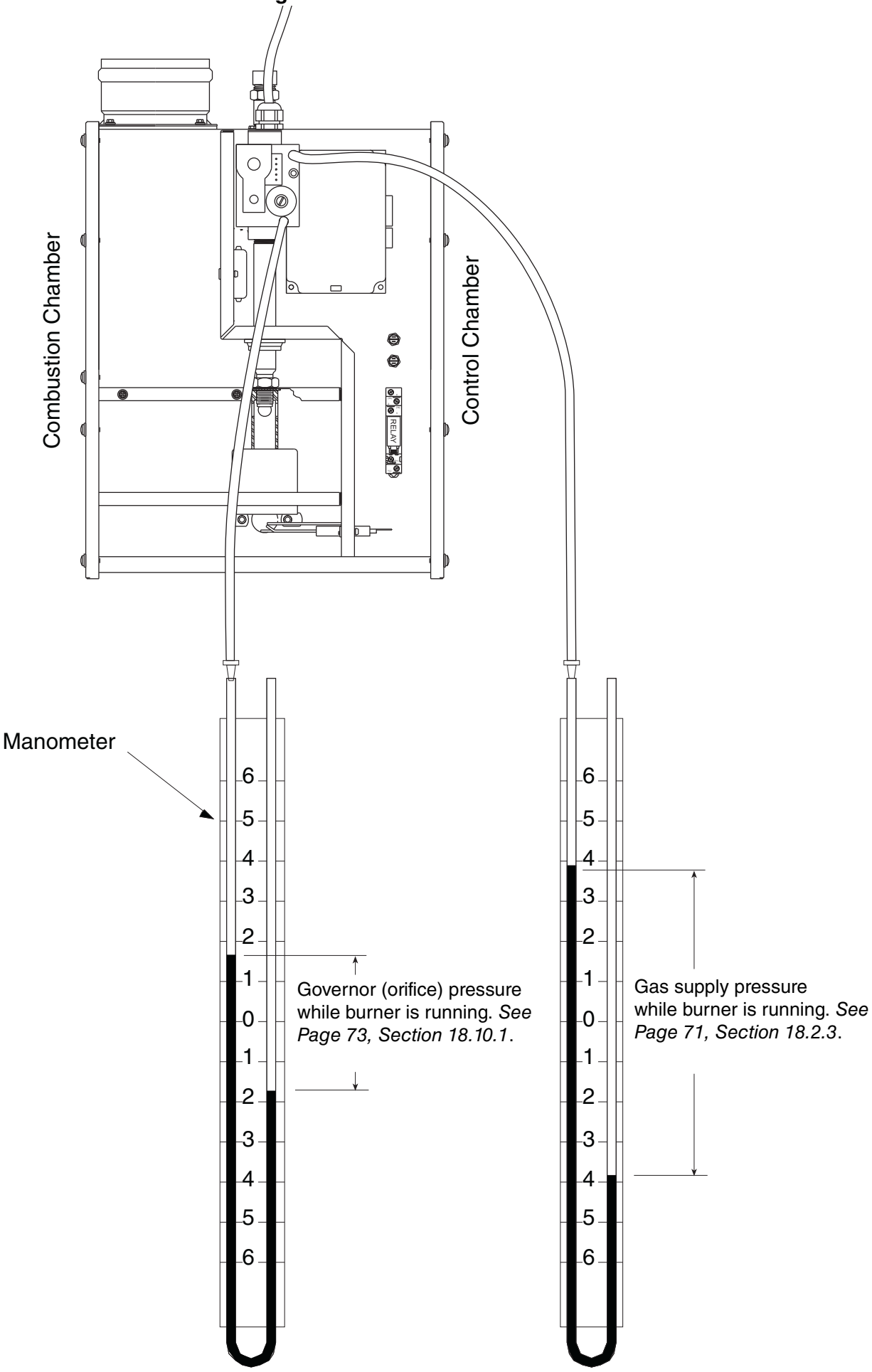
16.2 Troubleshooting Flow Chart (Multiburner)



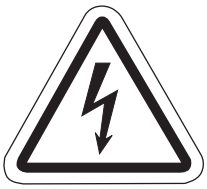
Troubleshooting Flow Chart (Multiburner)



16.3 Manifold Gas Pressure Setting



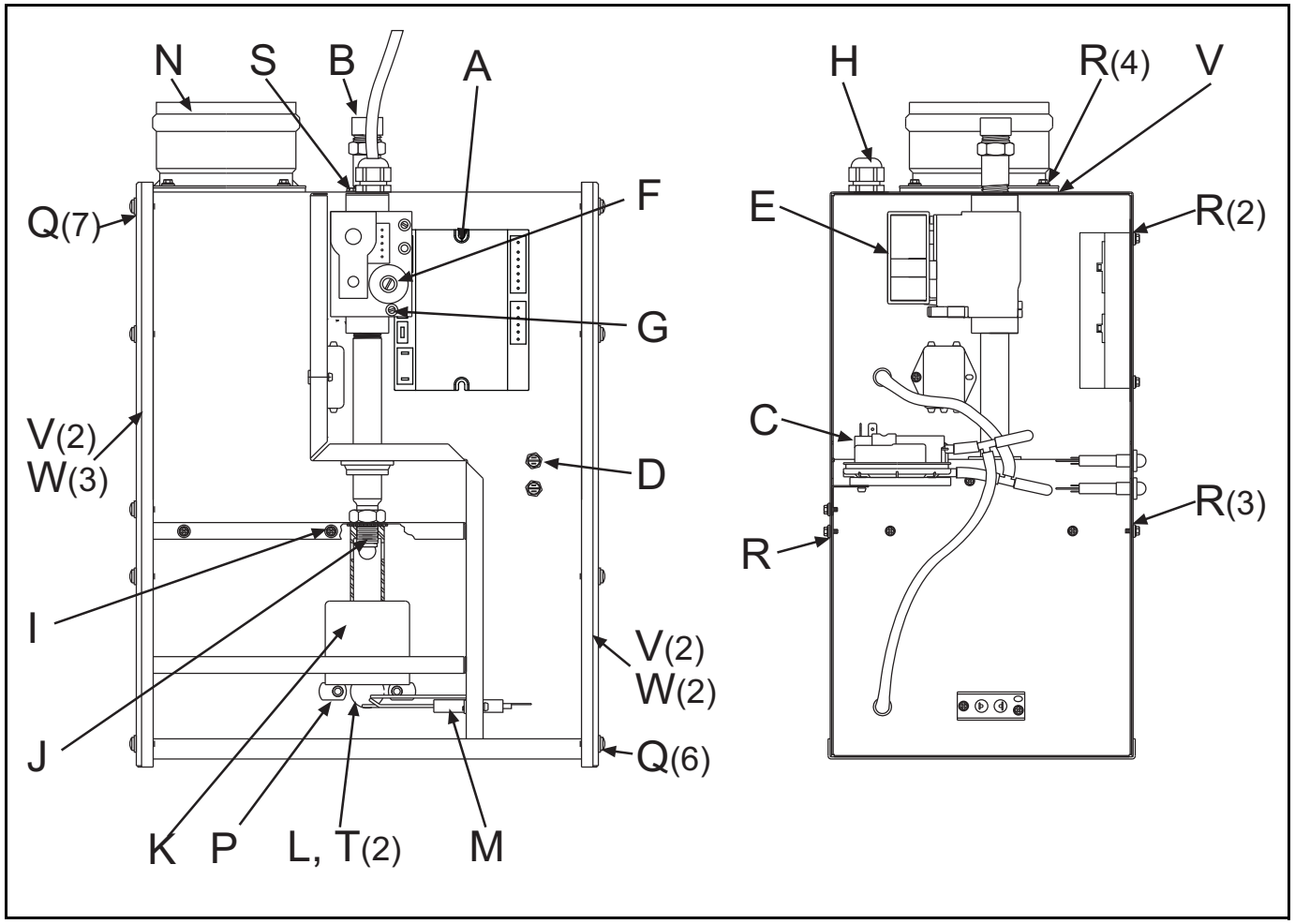
SECTION 17: REPLACEMENT PARTS

⚠ DANGER	⚠ WARNING		
			
Electrical Shock Hazard	**Explosion Hazard**	**Fire Hazard**	**Carbon Monoxide Hazard**

Use only genuine ROBERTS GORDON® replacement parts per this installation, operation and service manual.

Failure to follow these instructions can result in death, electric shock, injury or property damage.

See warnings and important information before removing or replacing parts. After any maintenance or repair work, always test fire the heater in accordance with the start-up instructions *on Page 57, Section 14* to help ensure all safety systems are in working order before leaving the heater to operate. Minor faults may be traced by using the troubleshooting charts *on Page 62, Section 16 through Page 67, Section 16.3*.



Item	Description	Part Number
A	Automatic Control Unit	90438704
B	Flex Line Adapter	91220700
C	Pressure Switch for HE50 HE35 HE15, 20, 30, 45 HE25 HE40	 90439801 90439802 90439803 90439804 90439805
D	Amber Neon Lamp	91320604
E*	Gas Valve	90033101
F	Governor Screw	N/A
G	Outlet Pressure Tap	N/A
H	Cable Gland	U169
I	Star Washer	96212100
J	Jet Orifice (*See Page 73, Section 18.10*)	N/A
K	Burner Cup Assembly	03020100
L	Mica Window Assembly	03360004
M	Electrode Assembly	90427403
N	Fresh Air Adapter	90501002

Item	Description	Part Number
P	Gasket 1/2" OD x 1/4" ID	92700008
Q	Gasket 1/2" OD x 3/16" ID	92700001
R	Gasket 3/8" OD x 3/16" ID	92700002
S	Valve Gasket	03200100
T	Window Gasket	92700003
U	Fresh Air Adaptor Gasket	92700005
V	Gasket 1/2" x 17 3/8"	92700006
W	Gasket 1/2" x 8.5"	92700007
N/S	Ignition Wire	90427704
N/S	Burner Tube Gasket	92700004
N/S	Wire Harness- Main Power	03320404
N/S	Wire Harness- Pressure Switch	03320405
N/S	Purple Wire	07250007
N/S	Electrode Gasket	02558501

**See Page 70, Section 17.1*.

17.1 Replacement Packages

17.1.1 Screw and Gasket Replacement Package (P/N 03360005)

Description	Quantity	Part Number
Screw M4 x 8mm	2	93304506
Screw 10-24 x 5/8	4	94118110
Screw #8 x 3/8	4	94118107
Screw M8 x 20 mm	2	93304507
Burner Tube Gasket	1	92700004
Fresh Air Intake Gasket	1	92700005
Rubber Gasket	10	92700002
Gas Valve Gasket	1	03200100

17.1.2 Viewer Window Replacement Package (P/N 03360004)

Description	Quantity	Part Number
Viewer Ring	1	01390203
Mica Window Square	1	02553200
Window Gasket	2	92700003
Screw M6 x 16 mm	2	93304505
Rubber Gasket	2	92700008

17.1.3 Door Gasket Replacement Package (P/N 03360002)

Description	Quantity	Part Number
Screw 10-24 x 5/8	2	94118110
Silicone Gasket	4	92700006
Silicone Gasket	6	92700007
Rubber Gasket	13	92700001

17.1.4 Gas Valve Replacement Package (P/N 03360003)

Description	Quantity	Part Number
Gas Valve SIT 840	1	90033101
Screw M4 x 8 mm	2	93304506
Gas Valve Gasket	1	03200100

SECTION 18: SPECIFICATIONS

18.1 Material Specifications

18.1.1 Combustion and Tubes

100 mm dia. 16 gauge heat treated aluminised mild steel.

18.1.2 Reflectors

NS3 H14 aluminium or 1.4016 2R stainless steel (option).

18.2 Heater Specifications

18.2.1 Sequence Controller

Fully automatic, single try, direct spark, 100% shut off ignition flame rectification module.

18.2.2 Electrical

Rating: 230 V, 50 Hz, 1 Ø, 1 A

Connection: minimum IP55 junction box

18.2.3 Gas Supply

Connection: Rc1/2 (1/2" BSP int)

Natural G20:

Minimum - Inlet 15 mbar (6 in wg)

Maximum - Inlet 50 mbar (20 in wg)

Natural G25:

Minimum - Inlet 17.5 mbar (7 in wg)

Maximum - Inlet 50 mbar (20 in wg)

LP Gas (Propane or Butane):

Minimum - Inlet 32.5 mbar (13 in wg)

Maximum - Inlet 50 mbar (20 in wg)

18.3 Venting Specifications

18.3.1 IP55 Protected Fans

HE15, 20, 25, 30, 35, 40,

HE45, 50, HE30DL,

HE40DL, 50DL, 70DL ..... Model: Torin DSA 146-052 (P/N 90710053)

Multiburner ..... Model: Airflow 83 BWLG IP55

..... Model: Airflow 90 BWLT IP55

Consult the manufacturer for availability of alternate fans.

18.3.2 Flue

The flue must be 100 mm, or greater in diameter, and must conform to National Codes. The flue must be self supporting. Inlet must be 100 mm diameter.

Multiburner - Flue will be 150 mm diameter. Flue material must conform to National Codes. The flue must be self supporting.

18.4 Suspension Specifications

Hang heater with materials with a minimum working load of 33 kg.

18.5 Controls Specifications

Time switches, thermostats, etc. can be wired into the electrical supply. External controls supplied as an optional extra.

18.6 Environment

The heater is limited to operate in an ambient temperature range of 0° C - 32° C (32° F - 86° F) with a maximum relative humidity of 95%.

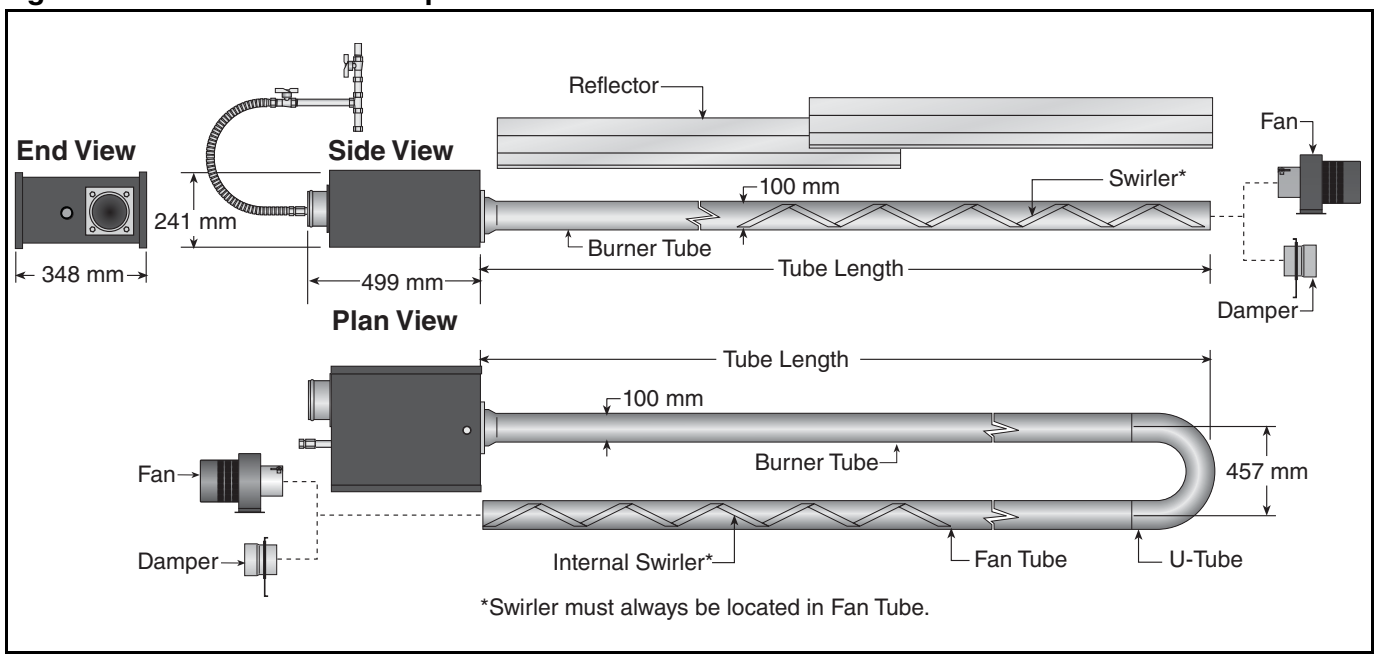
18.7 Linear Heater	HE15ST	HE20ST	HE25ST	HE30ST	HE35ST	HE40ST	HE45ST	HE50ST
Input - Gross (kW)	15	20	25	30	35	40	45	50/51
Input - Net (kW)	13.5	18	22.5	27	31.5	36	40.5	45/46
Tube Length (mm)	6096	9144	9144	12192	12192	12192	15240	15240
Overall Heater Length (mm)	6887	9935	9935	12983	12983	13028	16076	16076
Weight (kg)	51	66	66	84	84	84	99	103
Heated Area (m^2)	20-160	30-210	40-265	50-315	55-370	65-420	70-475	80-525
Minimum Installation Height (mm)	3500	3500	3500	3500	4600	5000	5000	5000
Recommended Installation Height (mm)	3500	3600	3900	4200	4800	5500	6700	7600

18.8 Double Linear Heater	HE30DL	HE40DL	HE50DL	HE60DL	HE70DL
Input - Gross (kW)	30	40	50	60	70
Input - Net (kW)	27.5	36	45	54	63
Tube Length (mm)	12802	18898	18898	24994	24994
Overall Heater Length (mm)	13914	20010	20010	26106	26106
Weight (kg)	92	124	129	164	164
Heated Area (m^2)	50-315	65-420	80-525	100-630	110-740
Minimum Installation Height (mm)	3500	3500	3500	3500	4600
Recommended Installation Height (mm)	3500	3600	3900	4200	4800

18.9 U-tube Heater	HE15UT	HE20UT	HE25UT	HE30UT	HE35UT	HE40UT	HE45UT	HE50UT
Input - Gross (kW)	15	20	25	30	35	40	45	50
Input - Net (kW)	13.5	18	22.5	27	31.5	36	40.5	45
Tube Length (mm)	3531	5055	5055	6579	6579	6579	8103	8103
Overall Heater Length (mm)	4048	5572	5572	7096	7096	7096	8620	8620
Weight (kg)	59	73	73	90	90	90	108	113
Heated Area (m^2)	20-160	30-210	40-265	50-315	55-370	65-420	70-475	80-525
Minimum Installation Height (mm)	3500	3500	4000	4700	5000	5000	5000	5000
Recommended Installation Height (mm)	3500	3600	4000	4700	5000	5500	6700	7600

18.10 Burner Specifications

Figure 35: Linear and U-tube Specifications



18.10.1 Standard Burner Specifications

Models			HE15	HE20	HE25	HE30	HE35	HE40	HE45	HE50
Burner Airplate ID Number			515	505	513	502	500	501	500	506
Jet Numbers - Natural G20 & 25			#31	#28	5/32	#17	#12	#8	#3	#1
Jet Numbers - Propane/Butane			#47	#43	#39	#33	#31	3.2 mm	#29	#28
Gas Consumption**	Natural G20	(m^3/h)	1.43	1.91	2.38	2.86	3.34	3.81	4.29	4.76
	Natural G25	(m^3/h)	1.66	2.22	2.77	3.32	3.88	4.43	4.99	5.54
	Propane	(m^3/h) [kgh]	0.56 [1.08]	0.75 [1.44]	0.94 [1.80]	1.13 [2.16]	1.32 [2.52]	1.51 [2.88]	1.69 [3.25]	1.88 [3.61]
	Butane	(m^3/h)	0.43	0.57	0.72	0.86	1.00	1.15	1.29	1.43
Governor Pressure	Butane	(mbar)	20.4	20.4	19.7	19.7	19.7	19.7	20	20.9
	Butane	(in wg)	8.1	8.2	7.9	7.9	7.9	7.9	8.0	8.4
	Propane	(mbar)	28.4	27.1	26.9	26.6	26.9	26.9	27.4	26.9
	Propane	(in wg)	11.4	10.9	10.8	10.7	10.8	10.8	11.0	10.8
Governor Pressure	Natural G20	(mbar)	10.0	9.5	9.5	9.5	9.2	9.5	8.7	8.7
	Natural G20	(in wg)	4.0	3.8	3.8	3.8	3.7	3.8	3.5	3.5
	Natural G25	(mbar)	15.4	14.9	15.2	14.9	14.2	14.9	13.7	13.2
	Natural G25	(in wg)	6.2	6.0	6.1	6.0	5.7	6.0	5.5	5.3

**Based on Gross Caloric Value.

Attach this information to a wall near the ROBERTS GORDON® heater.

ROBERTS GORDON®
Infrared Heating

Read the Installation, Operation, and Service Manual thoroughly before installation, operation, or service.

Know your model number and installed configuration.

Model number and installed configuration are found on the burner and in the Installation, Operation and Service Manual.

Write the largest clearance dimensions with permanent ink according to your model number and configuration in the open spaces below.

OPERATING INSTRUCTIONS

1. STOP! Read all safety instructions on this information sheet.
2. Open the manual gas valve in the heater supply line.
3. Turn on electric power to the heater.
4. Set the thermostat to desired setting.

TO TURN OFF THE HEATER

1. Set the thermostat to off or the lowest setting.

IF THE HEATER WILL NOT OPERATE, TO ENSURE YOUR SAFETY, FOLLOW THESE INSTRUCTIONS TO SHUT DOWN YOUR HEATER

1. Set the thermostat to off or the lowest setting.
2. Turn off electric power to the heater.
3. Turn off the manual gas valve in the heater supply line.
4. Call your registered installer/contractor qualified in the installation and service of gas-fired heating equipment.

⚠WARNING

Fire Hazard

Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury or property damage.

Maintain_____clearance to the side and _____ clearance below the heater from vehicles and combustible materials.

Roberts-Gordon LLC
1250 William Street
P.O. Box 44
Buffalo, NY 14240-0044 USA
Telephone: +1.716.852.4400
Fax: +1.716.852.0854
Toll Free: 800.828.7450

Roberts-Gordon Europe Limited
Unit A, Kings Hill Business Park
Darlaston Road, Wednesbury
West Midlands WS10 7SH UK
Telephone: +44 (0)121 506 7700
Fax: +44 (0)121 506 7701

Service Telephone: +44 (0)121 506 7709
Service Fax: +44 (0)121 506 7702
E-mail: uksales@rg-inc.com
E-mail: export@rg-inc.com

Installation Code and Annual Inspections:
All installation and service of ROBERTS GORDON® equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Roberts-Gordon and conform to all requirements set forth in the ROBERTS GORDON® manuals and all applicable governmental authorities pertaining to the installation, service, operation and labeling of the equipment. To help facilitate optimum performance and safety, Roberts-Gordon recommends that a qualified contractor conduct, at a minimum, annual inspections of your ROBERTS GORDON® equipment and perform service where necessary, using only replacement parts sold and supplied by Roberts-Gordon.

Further Information: Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through ROBERTS GORDON® representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.

This product is not for residential use.

© 2012 Roberts-Gordon LLC All rights reserved. No part of this work covered by the copyrights herein may be reproduced or copied in any form or by any means – graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems – without written permission of Roberts-Gordon LLC.

www.rg-inc.com Printed in U.S.A. P/N 91037912 Rev. J